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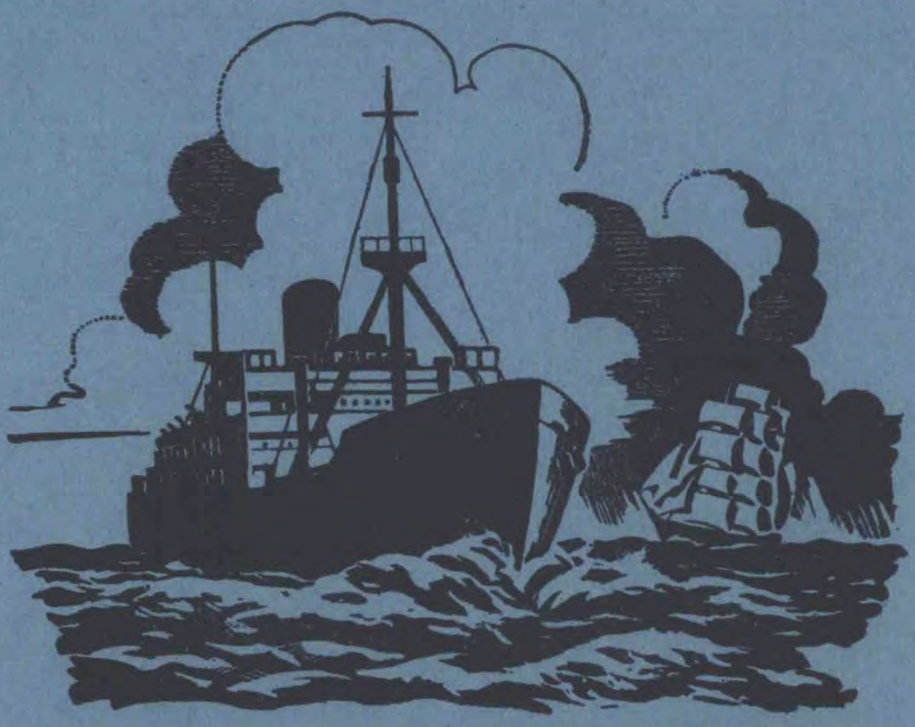
M.O. 528

The Marine Observer



Volume XX No. 148

APRIL, 1950

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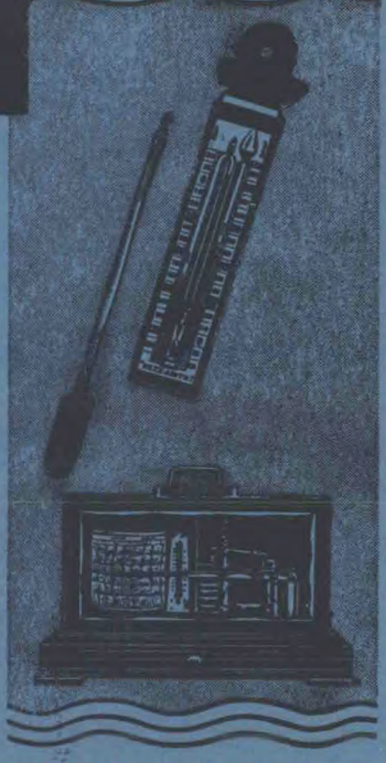

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M.O. 528 AIR MINISTRY

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A Quarterly Journal of Maritime Meteorology

prepared by the

Marine Branch of the Meteorological Office

VOL. XX No. 148 APRIL 1950

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EDITORIAL

On 18th January, 1950, aboard the *Wellington*, headquarters ship of the Honourable Company of Master Mariners, three British master mariners were presented with barographs by the Director of the Meteorological Office, in recognition of their having done voluntary meteorological work at sea of a consistently high standard over a period of more than fifteen years.

The recipients of this award were Captain Holland, recently retired from command of the New Zealand Shipping Company's steamer *Rangitiki*, Captain Duggan, now commanding the Canadian Pacific S.S. *Empress of Australia*, and Captain Johnston, in command of the Blue Funnel steamer *Indomeneus*. Captains Holland and Duggan have been voluntary observers since 1921 and Captain Johnston since 1923.

On 30th December, 1949, a similar presentation was made to Captain Patchett, master of the Cunard White Star steamer *Vardulia*, aboard his ship at Liverpool.

By permission of Sport and General, Ltd.

The Court-room scene in the *Wellington*.

L to R. Capt Saul (Senior Warden), Sir Nelson Johnson, Sir Frederick Bowhill, Mr. Smith (the Clerk), Capt. Glasson (Deputy Master).
The oil painting in the background represents the scene in the Mansion House on 8th March, 1932, when the Lord Mayor of London presented the grant of livery to H.R.H. the Prince of Wales as Master of the Hon. Co of Master Mariners.

The ceremony aboard *Wellington* took place in the handsome Court Room of the Honourable Company in the presence of the Master, Sir Frederick Bowhill, the Deputy Master, the Senior Warden and the Clerk, all wearing the ceremonial robes of a City Company for the occasion.

At this ceremony Sir Nelson Johnson, Director of the Meteorological Office, warmly thanked the masters and officers of the Merchant Navy for the very valuable assistance they provide the Meteorological Office not only of

this country but throughout the world in voluntarily making observations in all oceans and sending the coded results by radio. He pointed out that the Weather Ships, although providing extremely valuable and regular information from fixed points, do not in any way lessen the continued importance of observations from a large number of merchant ships.

It seems very appropriate that these presentations in recognition of good meteorological work at sea should thus be made at the headquarters of this youngest of the City Companies—representative of one of the most ancient crafts in our history—the Honourable Company of Master Mariners. The *Wellington*, although a relatively modern ship and having a naval upbringing, is the home of the master mariners and thus has a great tradition behind her and a great responsibility before her. The Honourable Company has as one of its aims that of maintaining a high standard of professional knowledge and ability among the officers of the Merchant Navy, and there is no doubt whatever that the practical and intelligent application of meteorology to his job is by no means the least important attribute of an efficient seaman for the safety of his ship and the care of his cargo, even in these days of steam.

Readers of this magazine will probably recollect that presentations were also made in 1948 to four captains who had served in vessels of the Port Line, Furness Line, Manchester Liners Ltd. and the Clan Line.

It is interesting to look back a little into history and into the association between the Meteorological Office and these shipping companies which are, after all, representative of all the Merchant Navy. A search through logbooks in the custody of this Office shows that our association with these companies dates back as follows: Port Line, 1856; Cunard White Star Line, 1870; New Zealand Shipping Company, 1876; Blue Funnel Line, 1877; Clan Line, 1883; Canadian Pacific Line, 1900; Manchester Lines, 1903; Furness Withy, 1868.

These figures are representative of a consistently pleasant and voluntary relationship between the masters and officers of British shipping companies and the Meteorological Office with the object of improving scientific knowledge. As a result of this historical *camaraderie* much valuable information has been obtained about the weather and the currents of the oceans.

It is noteworthy that not only had the recipients of these special awards performed a long period of voluntary meteorological work at sea but the quality of their work has been consistently high. The veteran, Captain Higgs, of the Port Line, who received his presentation in 1948, has been a voluntary observer since 1910. The number of times each of these individual's work has been classified as "Excellent" during the period of his voluntary service is 49, 42, 35, 16, 13, 11, 8 and 7, and there was a correspondingly high number of "Very Good" classifications. There is no doubt that these small tokens of appreciation from the Director of the Meteorological Office were well deserved by the recipients, and it is hoped that the existence of such awards will help to strengthen the already pleasant association between the Meteorological Office and the masters and officers of British merchant ships.

Mariners have always been seekers after the truth, wishing to see things with their own eyes, and it is that desire to see the world which probably urges most seamen to go to sea in the first place. As an island race let us hope that British boys will always have this spirit of adventure to be sailors,

explorers or traders, for it is largely upon the work of these that Britain has built her greatness. On other pages of this number will be found reference to an Anglo-Scandinavian expedition which is now on its way to the Antarctic, and to the work of expeditions made by merchant seamen of the past in that same inhospitable district. There are not very many parts of the world now that have not been explored at least once, so that the excitement of delving into the unknown does not often confront the would-be adventurous traveller nowadays, but there is still the satisfying compensation of trying to add to our knowledge about some little-known corner of the world, and therein may lie enough adventure and danger and discomfort for anybody. There are always plenty of volunteers for these scientific expeditions.

The mariner, from the nature of his calling, living as it were close to nature, always tends to take an interest in scientific matters, be it navigation, or the study of the weather, the handling of ships, or the proper care of cargo—all these are matters with a scientific background. When one reads the " Marine Observers' Log " or browses through old meteorological log-books, one realises how deeply some mariners delve into meteorological and oceanographical phenomena and sometimes, particularly in the case of sailing ships, into such subjects as ornithology. For example, one reads in the logbook of the S.S. *Nestor*, Captain Freeman, on a voyage from Liverpool to Shanghai in July 1877 : " Passing Maldive Islands, steady breeze from west again. Made sail. Heavy nimbus : a halo round the moon. . . . Drew a bucket of water and putting some of it under the microscope found it full of daphnia or water fleas. . . . Frigate birds, petrels and flying fish abound."

The voluntary observer aboard the modern steamship has little opportunity of obtaining specimens of birds or of marine life. He has other opportunities, however, of making quite unique scientific observations, for example, of a total eclipse of the sun, or the birth of a volcanic island, or of an exceptional auroral display, or perhaps of recording some special meteorological conditions which affect radar performance in some unexpected manner. The officer on the bridge of a ship who keeps his eyes open is really in a most favourable position for observing various manifestations of nature.

The logbooks which are being received in the Meteorological Office at present from voluntary observers in British ships, give ample evidence that there is in general no lessening of interest for meteorological and scientific observations on the part of ships' officers now as compared with the days of the sailing ship. As for the quality of the observations there is evidence that generally the standard is reasonably high. The instruments which are supplied are accurate and it is believed that the instructions which are issued are lucid. At the same time there is no doubt that the radio officers do their part loyally and efficiently, often under difficult conditions, in getting the radio weather messages through to their appropriate destinations.

Every British merchant ship " showing her flag " in the ports of the world has aboard her, in the persons of her master and ship's company, a number of ambassadors who have it in their power to do much to promote international good will. By co-operating in an international scheme for sending weather messages to all countries British ships make an additional contribution towards agreeable international relationship.

APRIL, MAY AND JUNE

CURRENT RIP AND DISCOLOURED WATER

Pacific Equatorial Waters

S.S. *Kent*. Captain N. A. Thomas. Brisbane to Balboa. Observer, Mr. A. B. Stalker.

25th May, 1949, 1505 A.T.S. Passed through a pronounced current rip running 095°–275° ; the water was discoloured a reddish-brown. Sounding showed no bottom at 160 fathoms.

Approximate position of Ship : Latitude 2° 23′N., Longitude 89° 17′W.

PHOSPHORESCENCE

Atlantic Equatorial Waters

M.V. *Warwick Castle*. Captain J. Trayner. Cape Town to Southampton. Observer, Mr. J. A. Scott, 4th Officer.

13th April, 1949, 0410 G.M.T. Passed through a large patch of exceptionally brilliant phosphorescence. The patch was formed by regular long wide streaks running with the wind and extended over several miles. Wind SE×S, 3, air temperature 80°F., sea 83°. Course 325° ; speed 18½ knots.

Position of Ship : Latitude 7° 41′S., Longitude 4° 01′W.

Pacific Ocean

S.S. *Essex Trader*. Captain C. Arundell. Singapore to Vancouver. Observer, Mr. D. Harris, 3rd Officer.

18th May, 1949, 1220 G.M.T. Numerous large bands of phosphorescence, 75 ft. to 150 ft. in breadth and about 300 yds. apart, were observed lying in a N–S direction. These bands, on being disturbed by the vessel, broke into myriads of exceptionally brilliant fragments. By 1245 the vessel had passed through the bands, and the sea before and after the observation was only slightly phosphorescent.

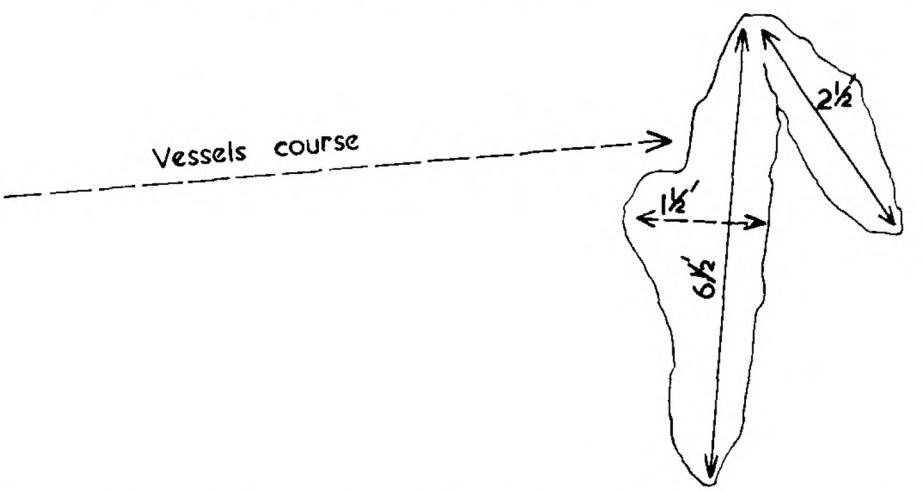
Position of Ship at noon : Latitude 42° 16′N., Longitude 158° 07′E.

ARCH SQUALL

Gulf of Guinea

S.S. *John Holt*. Captain A. Kennedy. On passage across the Gulf of Guinea. Observer, Mr. W. L. Harrison, 2nd Officer.

28th April, 1949, 1730 G.M.T. Barometer 1010·9 mb., air temperature 82°F., wind 180°, force 3. An arch squall was observed bearing 120° moving in a N'ly direction. Its length and depth as determined by radar was $6\frac{1}{2} \times 1\frac{1}{2}$ miles at its broadest part in a line 005° to 185°. As it passed over the vessel the wind increased to force 6 for a short period but did not change



direction, moderate rain fell for about 10 minutes. A secondary squall of less intensity was observed on radar at its northern end. Clouds at the time were heavy Cb., estimated height 500 ft. towering to 15,000 ft. Course 087°(T). Speed 12 knots.

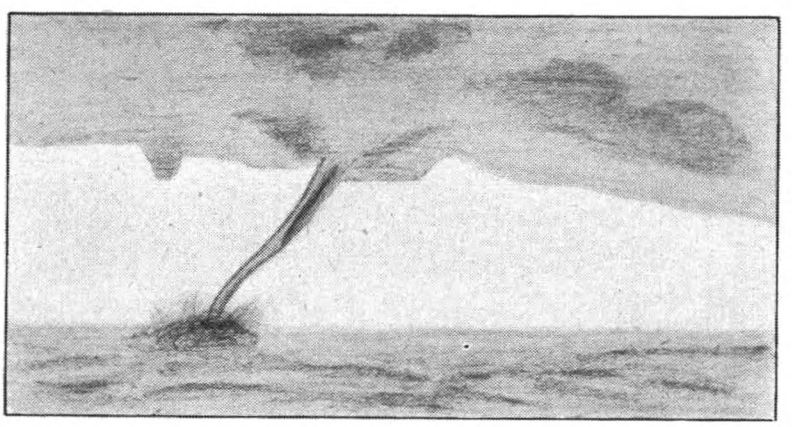
Position of Ship : Latitude 4° 22'N., Longitude 5° 28'W.

WATERSPOUTS

Gulf of Mexico

S.S. *Jersey City*. Captain I. Williams. Galveston to Cochin. Observer, Mr. D. Baker, 2nd Officer.

15th May, 1949, 1930 G.M.T. Three very distinct waterspouts were observed within an approximate radius of 5 miles from the ship. They extended from the base of Cb., estimated height 1,500 ft., into a cloud of spray at sea surface. The nearest spout (shown in the sketch) passed 3 miles



(approximate) distant and travelled in a NNE'ly direction at 15 knots. No material change in wind direction and force was experienced, neither was any clear rotational movement seen. Cloud at the time was Cb., Cu., Ac.; amount of Cb. 3/8, total amount 5/8. Barometer 1015·8 mb., falling slightly, and air temperature 78·5°F.

Position of Ship : Latitude 26° 40'N., Longitude 88° 05'W.

MIRAGE

Off Thames Estuary

S.S. *Fort Musquarro.* Captain J. D. Armstrong, D.S.C., R.D., R.N.R. Observer, Mr. D. L. Button, 3rd Officer.

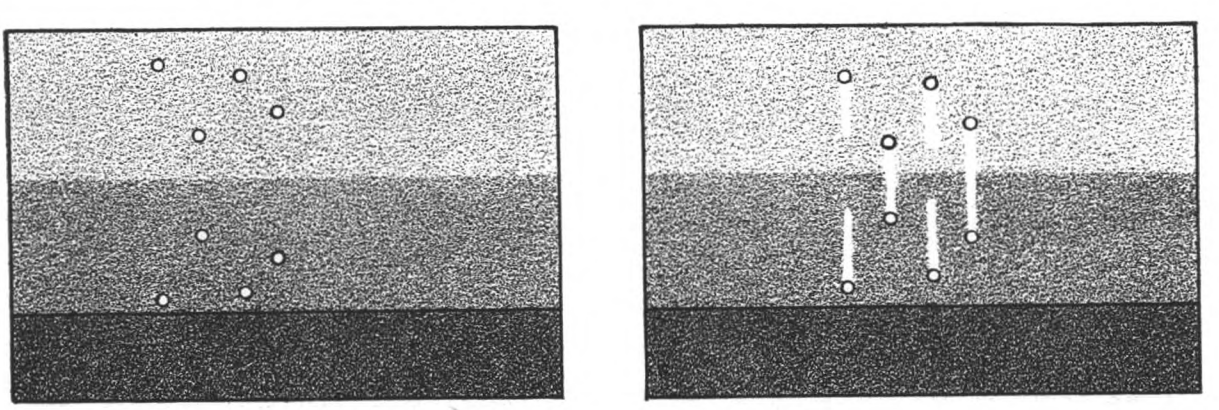
6th June, 1949, 2130 to 2230 G.M.T. Abnormal refraction was observed all round the horizon and every light in the Thames Estuary was clearly visible. The most striking feature lay to the southward, where the green fixed light on Margate pierhead was seen at a distance of approximately 16 miles. This light is normally visible at a distance of 2 miles. Lighted windows in the town itself were also clearly visible behind the pier light, the Casino on the waterfront showed up particularly well. Wind S'ly, force 2, barometer 30·08 in., air temperature 57°F., sea 58°. Cloudless, fine and clear, rippled sea.

Position of Ship : 1½ miles to the east of Kentish Knock lightvessel.

English Channel

M.V. *Stirling Castle.* Captain W. A. Pace, O.B.E. Observers, Mr. M. A. Gray, 4th Officer, and Mr. T. Cable, 2nd Officer.

15th April, 1949, 0300 G.M.T. A vessel was picked up about 4 points on the port bow, about 20° forward of the bearing of the moon. With binoculars, the lights of the vessel appeared to be duplicated for short periods. This duplication was symmetrically opposite to the true lights, as shown in the sketch. When the upper lights merged with the lower lights they appeared



to form vertical strips of light. The distance of the vessel was about 5 miles. The phenomenon lasted about 15 minutes, by which time the vessel was directly beneath the moon. Barometer 1017·5 mb., air temperature 54°F., wet bulb 52°, sea 53°. Light airs, rippled sea, heavy low W'ly swell. Full moon, low belt of haze, visibility approximately 12 miles, no low cloud, about a quarter of the sky covered with Ci. Course 235°(T). Speed 19 knots.

Position of Ship: Latitude 49° 11'N., Longitude 4° 10'W.

Off West Coast of the U.S.A.

M.V. *Pacific Exporter*. Captain W. F. Swann. Observer, Mr. R. E. G. Simmons, 1st Officer.

14th April, 1949, during late forenoon. When off the west coast of the U.S.A. in lat. 46°, a bank of what was thought to be fog began forming in the N.E. Later, however, at 1330 it was observed that this bank surrounded the ship on all sides ; in view of this and of the appearance of the bank it was decided that it must be a mirage. The weather was cloudless with a hazy sky and horizon, although the visibility was excellent ; at 1400 wind NNE, force 3, air temperature 56·5°F., wet bulb 52°, sea 53·2°. Light smoke from the funnel was forming layers to leeward, showing the existence of an inversion of the temperature gradient. The mirage lasted throughout the afternoon and a number of observations were made. At 1345, when the ship's position was lat. 45° 27′N., long. 124° 57′W., course 177°, speed 12 knots, sketches were made of the horizon mirage on various bearings. In directions away from the sun these had a cliff-like appearance with a corrugated dark upper edge, which was ruffled and constantly moving, although not always changing its shape. The altitude of this was from 9′ to 11′ on different bearings. In the direction of about 120° two colours were seen, the upper part being blue-grey while the lower was dove-grey, this latter being the general colour of the mirage on other bearings. Fig. 1 shows the appearance

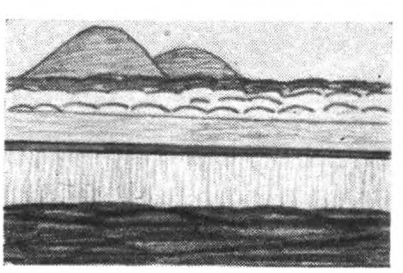


Fig. 1

of the mirage in the direction 070°. The lower dark layer is the sea surface. The upper dark line resembled a layer of Ac. cloud as seen from an aeroplane flying above it and was much thicker than in other parts of the horizon. Saddle Mount, distant 60 miles, was seen at 1400 above the mirage but by 1430 had disappeared from sight as cloud was forming. At 1400 the mirage

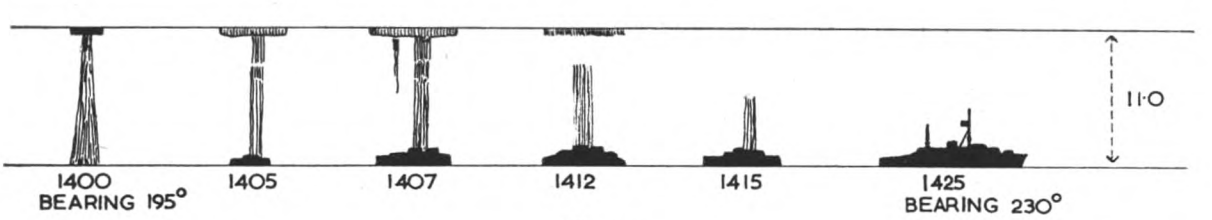


Fig. 2

of a vessel began to appear as a dark spot on the upper line of the mirage, connected to the true horizon by a conical regular column which was thought to be smoke. The sequence of appearances is shown in Fig. 2, in which the

final appearance of the sloop at 1425 has been enlarged in order to give a more accurate reproduction. It was noticed that this sloop made no visible smoke, and at the upper junction of her tripod mast there was a very definite conglomeration of instruments which showed up rather dark. The estimated range at 1425 was 20,000 yards. From 1400 to 1435 a tanker presented similar appearances of upward elongation. At 1445, when the sun was bearing 223°, altitude 43°, a change occurred in the appearance of the mirage to the northward. The upper part was in constant movement and changing its appearance, sometimes rising above the lower cliff-like wall, leaving only a light grey line in between. At about 1500 the mirage began to disperse to the southward.

1515 : Corrected barometer 1012 mb., air temperature 57·9°F., wet bulb 52·6°, sea 52·9°, wind N, force 3, mirage now only visible from 280° to 120° through N.

1545 : Mirage visible from 330° to 090° through N.

1700 : Mirage had disappeared.

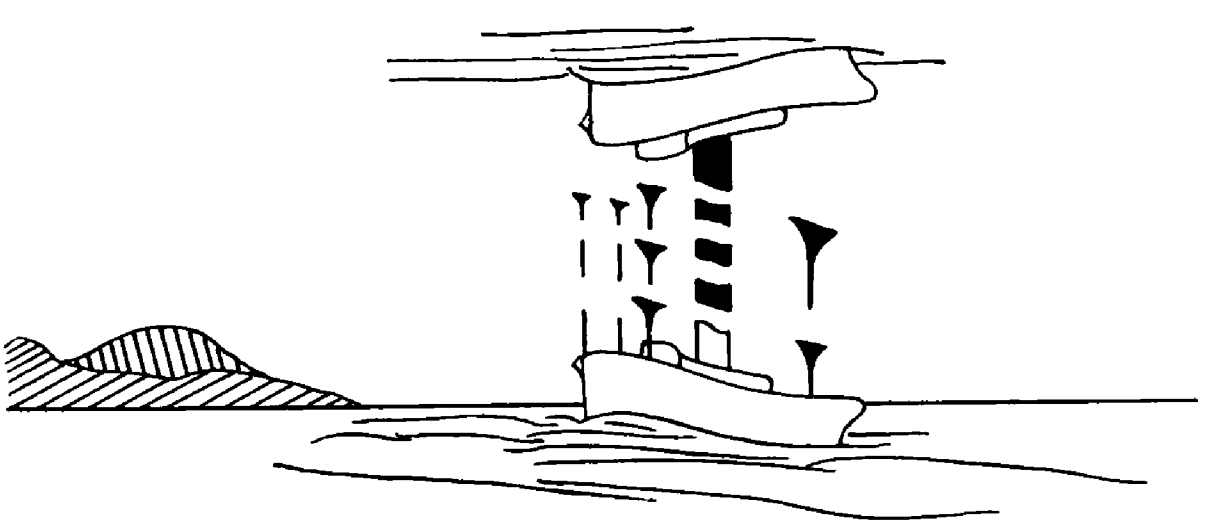
1800 : Banks of fog were visible to S and E, spreading towards W.

1900 : Thick fog at ship, wind SE, force 4.

Off Cape Chat

S.S. *Ascania*. Captain J. Chapman, R.D., R.N.R. Liverpool to Montreal. Observer, Mr. G. H. Griffiths, 2nd Officer.

17th June, 1949, 0915 G.M.T. When proceeding westward via Cape Race we were in position, Cape Chat bearing 190°, distant 8 miles, and the sun was rising astern of us with an altitude of about 8°. A vessel was seen in the west which was later identified as the cargo liner *Lismoria*. This vessel appeared as two images, one upside down on the other, as shown in the accompanying sketch. The vessel was first sighted at 8 miles, and the mirage



decreased as the vessel closed us until it disappeared completely at about 3 miles. There was no evidence of mirage to the north or the east, but villages on the coast to the southward were similarly refracted.

Leaving Straits of Gibraltar

S.S. *Stanthorpe*. Captain R. G. Roberts. Port Said to London. Observer, Mr. D. W. Davidson, 3rd Officer.

19th May, 1949, 0900 G.M.T. An exceptional mirage was observed. The cliffs near Punta de Sagres Lighthouse appeared very distorted, also ships seen to NW. The land to N and ships in other directions appeared normal. The sun was 45° above the horizon with 3/8 Sc. and Ci. Corrected barometer 1021 mb., air temperature 61°F., wet bulb 56°, wind 312°, force 2–3. Course 292°. Speed 10 knots.

Position of Ship : Latitude 36° 47'N., Longitude 8° 47'W.

Malacca Strait

S.S. *Twickenham*. Captain J. A. Tully. Colombo to Shimizu. Observer, Mr. J. Porteous, 2nd Officer.

24th June, 1949, 0740 G.M.T. Cape Rachado Lighthouse was clearly visible at 27 miles distance. Cape and lighthouse appeared to be raised above the horizon, separated from it by a narrow strip of water. Temperatures : air 83°F., wet bulb 77°, sea 85°, light SE breeze, very good visibility.

Position of Ship : Latitude 2° 35'N., Longitude 101° 26'E.

VISIBILITY, MIRAGE AND GREEN FLASH

Approaching Montreal

S.S. *Bassano*. Captain D. B. Ramsbottom, D.S.C. Hull to Montreal. Observer, Mr. J. B. Harbord, 3rd Officer.

11th May, 1949, 1440 G.M.T. The blue hills of Couteau were observed very distinctly at 60 miles. The sky was mainly overcast with St. and Sc. Barometer 1020·2 mb., air temperature 37°F., wet bulb 36°. Visibility continued to be excellent throughout the day, and at 2000 the coastline of C. Breton Island in the vicinity of Cape North appeared as an inverted image. Later, just before sunset at 2230, it was observed again as illustrated

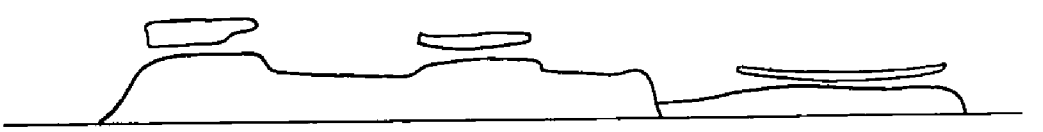


Fig. 1

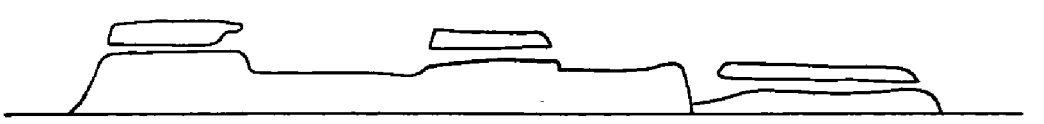


Fig. 2

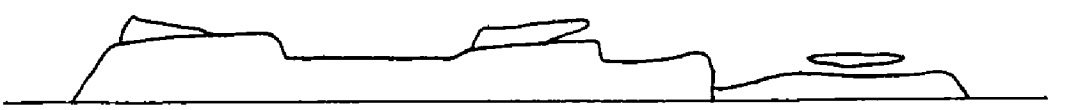


Fig. 3

in Figs. 1, 2 and 3. Barometer 1024 mb., air temperature 36°F., wet bulb 35°, sea 37°.

At sunset the sun was considerably distorted, presenting the various shapes shown below.

Fig. 4

Finally the green flash was observed with green rays quite distinct. Barometer 1025·8 mb., air temperature 36°F., sea 37°.

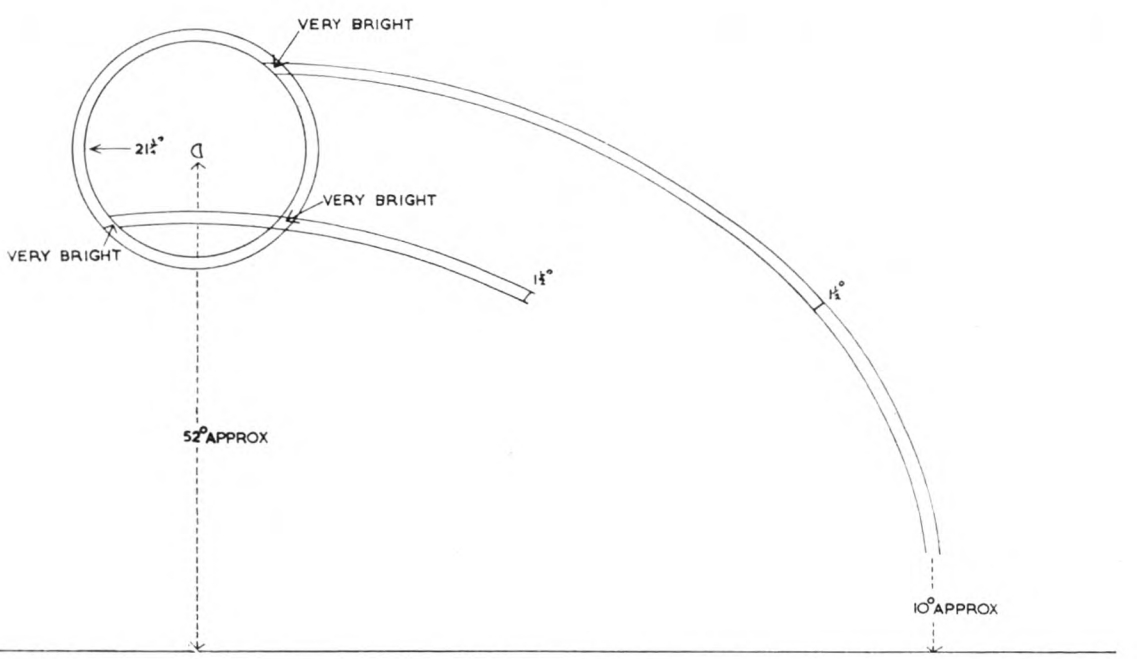
Position of Ship : Latitude 46° 58′N., Longitude 57° 30′W.

LUNAR HALO

Indian Ocean

S.S. *Atlantis*. Captain L. T. Peterson. Wellington to Southampton. Observer, Mr. B. Baxter, 4th Officer.

16th June, 1949, 2150 G.M.T. Observed lunar halo of radius $21\frac{3}{4}^{\circ}$ showing as a plain white ring, Cu. and Ci. were present. At 2210 two bright arcs appeared (as in sketch) and were particularly bright at points of contact



with halo. The upper arc continued to approximately 10° above the horizon, the lower arc faded out at 2230, the halo and upper arc disappeared at 2240. The moon was 20 days old at an approximate altitude of 52°.

Position of Ship : Latitude 0° 25′N., Longitude 60° 25′E.

Note. The two arcs intersecting the halo of $21\frac{3}{4}^{\circ}$ in the above observation do not come within the category of well-known halo phenomena. The observation is therefore of interest. Many arcs and other halo phenomena probably occur which are usually too faint to be seen, but which may be seen on rare occasions, when conditions are exceptionally favourable.

AURORAE

North Atlantic Ocean

O.W.S. *Weather Explorer*. Captain H. R. Wilkinson, R.D., R.N.R. At Station " Item ", 60° 00'N., 20° 00'W.

19.4.49 0300 Auroral display over an area between 340° and 020°, and horizon to elevation 18°. This display had strength of civil twilight. It remained so for at least half an hour afterwards.

19.4.49 to 20.4.49 2300 to 0300 Slight display between 340° and 020° extending from horizon to elevation 10°. Constant strength and position. Ship's position : 59° 45'N., 20° 03'W.

21.4.49 0001 Sky illuminated to 25° elevation between 040° and 310°.

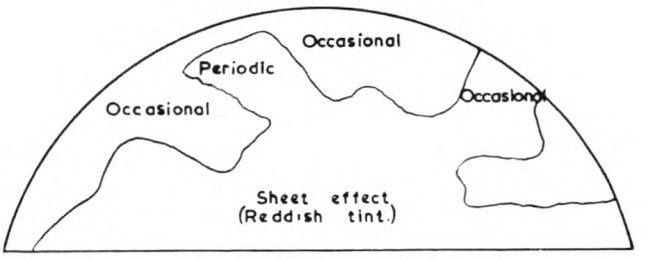
0110 Extended its vertical development to 50° elevation, but decreased its horizontal area to between 020° and 340°. Ship's position : 59° 56'N., 20° 15'W.

0130 Very little change apart from a decrease in strength. The entire display had moved bodily along the horizon until it was steady between 360° and 270°.

0200 Strength greatly decreased, and only visible between 360° and 315°.

0230 Slight glare remained up to elevation 10° over the NW horizon.

General notes. None of the above displays were exceptionally spectacular. The best display (19.4.49, see fig.) had a sheet effect from the horizon to elevation 25° to 30°, and above this thin veils extended with a flickering



effect. Towards the zenith, faint isolated wisps appeared periodically and regularly to the south of west, but only occasionally, as shown in the figure. The best display did not last more than 20 minutes, and interference was experienced on the Loran screen and to a certain extent on general wireless reception.

13.5.49 2300 Glare visible between 290° and 030°, average common brightness.

14.5.49 0000 Had faded to a mere trace along horizon (54° 00'N., 15° 59'W.).

,, 0100 Regained strength to that at 2300.

,, 0200 As at 0100.

14.5.49 0300 Diminished to a general glare. Somewhat blanked by moonlight (54° 02′N., 16° 52′W.).

,, 0400 Glare merged into twilight.

At Station " Jig ", 53° 50′N., 18° 40′W.

16.5.49 2300 Glare visible between 290° and 055°, bright between 330° and 360°, with a reddish tint, approaching sunset strength along horizon to an elevation of 5°. Hence, decreasing strength to elevation 22°. Loran scan showed unusual orange duplicate of echo to every signal. Radio reception on medium wave bands had suffered interference. However, at 2320 radio reception was normal. Orange echo line on Loran scan also disappeared at the time, although the auroral glare was still as at 2300.

0150 The glare had almost disappeared.

1430 A large sunspot was observed about a third the way from the centre (along radius in position " 11 o'clock ").

18.5.49 1330 A large sunspot visible, slightly off the centre at position " 3 o'clock ".

,, 2300 Position 53° 48′N., 18° 38′W., auroral glare, bright at horizon and evident to elevation 30°, between 050° and 270° (through N).

19.5.49 0001 Glare faded considerably, and only visible between above bearings to elevation 10°.

,, 0100 Only a weak light remains. Position 53° 50′N., 18° 43′W.

No effects observed on the Loran scan, and no radio interference experienced.

S.S. *Matheran*. Captain A. B. Bannatyne, O.B.E. Port Said to Boston, U.S.A. Observers, the Captain and Mr. R. M. Lucas, 3rd Officer.

8th April, 1949, 0115 G.M.T. An auroral display was observed covering an arc of sky between N and WNW, altitude approximately 18°. It was bright red and visible for 20 minutes. Weather conditions : wind W × S, 4, air temperature 60°F., wet bulb 54°, barometer steady at 1008 mb., visibility 25 miles.

Position of Ship : Latitude 39° 36′N., Longitude 59° 52′W.

South Pacific Ocean

S.S. *Fordsdale*. Captain T. T. Oliver. Auckland to Panama. Observer, Mr. A. O. Griffiths, 3rd Officer.

8th April, 1949, 1000 G.M.T. A dull, deep red glow was visible above a bank of Cu. lying low on the horizon. It extended from 190° to 235°, at an altitude of approximately 17°. The centre was a more intense red than the edges, and at 1010 the whole began to gradually fade until 1020 when it finally disappeared.

Position of Ship : Latitude 36° 44′S., Longitude 176° 20′W.

Australian Waters

M.V. *Hurunui.* Captain A. E. Williams. Brisbane to Wellington. Observer, Mr. N. Collett, 3rd Officer.

8th April, 1949, 1010 G.M.T. Observed " Southern Lights " in the form of a brilliant crimson glow covering the whole southern third of the sky. The lights varied in intensity but never formed any definite edge or shape. The main display lasted 8 minutes and each recurrence grew successively weaker, the last display ceased at 1025. The sky was clear and brightly moonlit.

Position of Ship : Latitude 36° 16'S., Longitude 167° 16'E.

S.S. *Amersham.* Captain A. Spence. Bombay to Geelong. Observer, Mr. E. T. Ward, 2nd Officer.

12th May, 1949, 1735 G.M.T. Observed the clouds bearing from S to S.W. turning a very brilliant red (as at sunset) which lasted for about 15 minutes and then gradually faded away. This had also occurred earlier at about 1330 G.M.T., lasting about 30 minutes. The sky was 3/8 covered with thin Ac.

Position of Ship : Latitude 32° 02'S., Longitude 112° 34'E.

M.V. *Georgic.* Captain R. Sell, R.D., R.N.R. Melbourne to Sydney. Observer, Mr. T. O'Sullivan, Junior 3rd Officer.

12th May, 1949, 0030 G.M.T. A crimson aurora was observed covering an arc of approximately 70° at an altitude of about 30°. Prevailing conditions were favourable, moderate N wind, cloudy and clear.

Position of Ship : Latitude 37° 00'S., Longitude 151° 00'E.

S.S. *Atlantis.* Captain B. A. Gammon. Southampton to Wellington, N.Z. Observer, Mr. R. Phillips, Senior 3rd Officer.

12th May, 1949, 0030 to 0050 G.M.T. Observed diffused auroral light which turned Ac. and Ci. cloud a moderate red. It commenced in the E, bearing 110°(T) ; by 0040 it had increased and spread over the whole of the southern sky from 110° to 240°, altitude 70°, then it faded in the E and eventually died away on the western horizon at 0050. Three distinct rays were seen for a few moments at 0030, bearing 180° and reaching an altitude of 70°.

Position of Ship : Latitude 37° 58'S., Longitude 135° 00'E.

S.S. *Papanui.* Captain B. Evans. Melbourne to New Plymouth, N.Z. Observer, Mr. T. M. Train, 3rd Officer.

12th May, 1949, 1230 to 1300 G.M.T. Observed brilliant display of Aurora Australis. The southern sky was brightly lit from 110° to 260°(T) by shafts of red and green light which reached to an altitude of 90°. The moonlight was very bright and visibility good. The sky was 1/8 covered with St. and trace of Cu.

Position of Ship : Latitude 39° 05'S., Longitude 146° 37'E.

One other ship reported aurora on 12th May in the Indian Ocean.

M.V. *City of Chester* : " Reddish patch sighted in sky S to SE at 1230 to 1300 G.M.T.". Position at 1200 G.M.T., lat. 30° 33'S., long. 91° 02'E.

South Tasman Sea

S.S. *Karetu.* Captain T. S. MacNicol. Bluff, N.Z., to Sydney. Observer, Mr. A. Macdonald, 3rd Officer.

4th May, 1949, 1145 to 1205 G.M.T. An auroral display was observed over an arc of the horizon S to S 30°W. Above the clouds of altitude 6° there appeared a yellow glow, becoming whitish yellow at about 15°, with occasional large slightly reddish streaks like searchlights reaching up to 40° altitude. After 20 minutes the sector became overcast and no more aurora was visible.

Position of Ship : Latitude 43° 30'S., Longitude 162° 30'E.

Other ships reported aurora on 8th April, 1949 :

S.S. *Rhodesia Star* in lat. 37° 45'S., long. 178° 41'E., at 0730 G.M.T. : " Aurora observed bearing approximately 210°(T). Sky a brilliant reddish and orange colour ; disappeared completely at 0740."

O.W.S. *Weather Observer* on Station " Jig " reported : " Aurora visible at 0300 G.M.T."

AURORA AND LUNAR ECLIPSE

Off St. John, New Brunswick

S.S. *Bassano.* Captain D. B. Ramsbottom, D.S.C. Observer, Mr. J. B. Harbord, 3rd Officer.

13th April, 1949, 0330 G.M.T. At the time of the total eclipse, aurora was observed over an arc of 150°, from 280° to 060°. It appeared in milk-white bands and rays, magnitude about 1·0, and reached an altitude of 35° to 40°. The eclipse was observed throughout, at which time the moon appeared a very dull brick-red colour.

Position of Ship : 20 miles S.S.W. of Partridge Island.

ECLIPSE OF MOON

North Atlantic Ocean

M.V. *San Adolfo.* Captain L. Mays. Las Palmas to Curaçao. Observer, Mr. R. W. Williams, 2nd Officer.

12th to 13th April, 1949. At 0330 G.M.T. the earth's shadow was observed to completely cover the face of the moon and remained so until 0500. During this eclipse there appeared to be an inner circle of a slightly reddish hue changing to amber around the moon's perimeter.

Position of Ship : Latitude 16° 04'N., Longitude 54° 08'W.

Caribbean Sea

S.S. *San Vulfrano.* Captain J. Thomson, O.B.E. Cabo Blanco, Peru, to Manchester. Observer, Mr. W. F. Hunt, 2nd Officer.

12th to 13th April, 1949. The total eclipse of the moon was observed at times indicated by nautical almanac. At the commencement the altitude of the lower limb was 44° 10′ approximately. The total phase commenced at 0328 G.M.T., altitude 55° 08′, and ended at 0454, altitude 60° 30′. The end of the eclipse was not observed owing to cloud.

Position of Ship : Latitude 16° 45'N., Longitude 75° 23'W.

METEORS

North Atlantic Ocean

S.S. *Brazil Star.* Captain G. M. Duff, G.M. Rio de Janeiro to London. Observer, Mr. D. M. McPhail, 3rd Officer.

19th May, 1949, 0003 G.M.T. A meteor was observed near α Centauri, bearing 170°, altitude 12°. It was bright yellow with magnitude about that of Venus. It travelled in a SW'ly direction and disappeared into a low bank of St., bearing 210°, altitude 7°. Duration of flight 5 seconds, but the trail, also bright yellow, remained for 10 seconds.

Position of Ship : Latitude 18° 54'N., Longitude 21° 57'W.

S.S. *Rhodesia Star.* Captain C. H. Watson. Curaçao to London. Observer, Mr. R. B. Escreet, 4th Officer.

31st May, 1949, 0230 G.M.T. A meteor was observed moving from the vicinity of γ Geminorum, R.A. 6h. 30m. Dec. 16° 30'N., H.A. 9h. 6m., approx. altitude 35°. It was visible for 7 seconds and disappeared in a position roughly R.A. 5h. 12m. Dec. 46°N., altitude 20°, near Capella. Its magnitude approximated to that of Altair and increased before disappearing. A short orange trail was also seen and the meteor's track was in arc form.

Position of Ship : Latitude 21° 17'N., Longitude 55° 00'W.

Atlantic Equatorial Waters

S.S. *Clan Chattan.* Captain H. C. Simpson, O.B.E. South Africa to Baltimore. Observer, Mr. J. W. Ward, 2nd Officer.

22nd June, 1949, 0441 G.M.T. On a N'ly bearing and at an angle of approach to the horizon of 45°, initial altitude 15°, a brilliant meteor appeared which travelled for about 2 to 3 seconds from N to E. It illuminated the night sky with a vivid green light and during its flight exploded three times. The first and second explosions appeared to increase the size and brilliancy of the meteor and the final explosion disintegrated the body and transformed the spectacle to a long trail of fragments which burnt out at an altitude of 7°. After the final explosion the light changed to a reddish hue and was powerful enough to be observed through Cu. along the horizon.

Position of Ship : Latitude 0° 40'S., Longitude 25° 00'W.

South Atlantic Ocean

M.V. *King William.* Captain A. B. Drever. London to South Africa. Observer, Mr. W. Knight, 2nd Officer.

13th April, 1949, 0315 G.M.T. A bright meteor was observed bearing 185° (approx.), altitude 20° (approx.). It appeared to burst like a " snow-flake " rocket with a brilliant greenish-blue flash and disappeared into the edge of a Cu. cloud. The sky was 2/8 clouded with Cu. and the moon was almost totally eclipsed. The glow could be seen through the cloud for about $1\frac{1}{2}$ to 2 minutes afterwards.

Position of Ship : Latitude 23° 50'S., Longitude 9° 23'E.

New Zealand Waters

M.V. *Avon Venturer*. Observer, Mr. T. D. L. Platt, 2nd Officer.

3rd June, 1949, 1601 G.M.T. A large yellow flash, similar to high explosive, was observed bearing 170° to 180° (top to bottom of tail) from the ship. It was like the explosion of a 15 in. shell and definitely illuminated the whole ship. In the light of the explosion a vapour trail was observed which extended from an altitude of 16° 46·8′ (where the flash occurred) to 33° 58′. Angles given to the approximate horizon. The position of the flash relative to stars was as follows: 1° below γ Crucis, 48° 46·8′ from Antares, 35° below α Centauri—all sextant angles. The vapour trail lasted 15 minutes, and about 75 per cent of it came down to 15° above the horizon, formed a cloud and drifted away to the southward. The smoke cloud appeared grey in colour and disappeared in a few minutes.

Position of Ship: Latitude 38° 07′S., Longitude 170° 31′E.

Pacific Ocean

M.V. *Inverbank*. Captain A. M. Williamson. Balbao to Brisbane. Observer, Mr. A. Teale, 2nd Officer.

5th April, 1949, 1146 G.M.T. A brilliant greenish meteor was observed falling vertically bearing 290°(T). It left a greenish white trail which extended for 10° and gradually tapered. The meteor appeared to break up and small particles fell with it. Altitude on appearance was about 35° and it disappeared 3° above the horizon, duration of flight approximately 5 seconds. A bright glow was seen for a few seconds after the meteor had disappeared.

Position of Ship: Latitude 16° 25′S., Longitude 156° 40′W.

M.V. *Pacific Exporter*. Captain W. F. Swann. Los Angeles to Balbao. Observer, Mr. M. J. Brown, 2nd Officer.

28th April, 1949, 0340 G.M.T. Observed a bright meteor which showed an even white brilliance throughout and left a white trail which was distinctly visible to the naked eye for 4 minutes. It first appeared bearing 080°, approximate altitude 40° just below Arcturus. It flew on a 315° course and disappeared bearing 355°, altitude 20°. The altitude of trail when bearing 045° was 36°. Duration of flight was unusually long and was estimated at 5 to 6 seconds.

Position of Ship: Latitude 22° 30′N., Longitude 110° 22′W.

Pacific Equatorial Waters

S.S. *Dunkery Beacon*. Captain A. C. E. Green. Sasebo to Nauru Island. Observer, Mr. J. D. B. Wylie, 3rd Officer.

17th May, 1949, 1015 G.M.T. A meteor was observed of a brilliance far greater than that of Venus. It appeared close to the constellation of Leo and disappeared about 7° above the horizon. Its duration of flight was less than 2 seconds and it was greenish white. The body and trail of the meteor disappeared abruptly and about 30 seconds later a distinct but soft report was heard. The light from this phenomenon was very bright and illuminated the whole ship to such an extent that although the night was dark, ventilators, windlass, etc., were clearly discernible.

Position of Ship: Latitude 1° 00′S., Longitude 166° 42′E.

WEATHER WISE

BY CDR. C. E. N. FRANKCOM, R.N.R.

PART II

This article is based on a talk given to Navigation School instructors attending a "summer course" at Cranfield Aeronautical College, on 21st April, 1949.

Masters

The syllabus for masters seems to be rather "loose" and it is a little difficult to give guidance upon it. I do not think there are any new developments concerning the first section, "Ocean Pilotage", but a study of the climatological atlases produced by the Meteorological Office, both as concerns winds and currents, would be helpful. For an overall picture one could not do better than to study the excellent maps published with *Ocean Passages of the World*. As for selecting routes according to season, it seems that, apart from Atlantic routes which are varied in accordance with the ice season, and the fact that small, low-powered westbound ships going across that ocean would probably be wise to shape a course via the Azores to avoid the worst of the weather in the winter-time, there is not much that one can recommend as far as steamships are concerned. At the same time there are considerations which might influence a ship master in deciding to go via Cape Horn, for example, when eastbound from the Pacific and through the Canal when westbound.

When dealing with icebergs, the possible use of radar for their detection should be borne in mind, and the valuable work of the International Ice Patrol should be emphasised. There is rather a variety of ice nomenclature in use, and a special Sub-Commission of the International Meteorological Organisation is trying to produce a simplified international nomenclature for the benefit of seamen. Codes for reporting ice by shore authorities are used chiefly in Baltic waters, and a special code is used for radio reports on ice conditions in those waters. There is at the end of the Washington Code, provision for reporting ice in a synoptic message, its basis being similar to the code used in many Baltic countries. Otherwise ice conditions are reported in plain language.

From a study of the syllabus it seems to be the intention that a master should not only know the principles of synoptic charts but should be able to plot one and should also be able to interpret the information which he receives by radio from the Meteorological Services. The best method of dealing with this seems to be to use the Atlantic Bulletin for Shipping as the basis of training. This Bulletin includes a general statement of existing weather, a forecast for the eastern Atlantic, current weather reports from a selection of coast stations and ship stations, and finally an analysis. The analysis contains enough information to enable isobars to be drawn; in other words the position of various points on the isobars is given and the isobars can be drawn accordingly. Station reports assist in drawing the isobars. As all ships will not necessarily wish to use the analysis, the Bulletin is deliberately framed so that it can be issued in parts, the most important parts coming first, and the ship master can use whichever parts he likes. It is probably desirable that masters should know how to utilise a weather analysis. There is now an international scheme whereby various countries bordering all the oceans will issue bulletins similar to the Atlantic

Bulletin, so that we have, at last, achieved some reasonable uniformity. It is in the master's own interest that he should know how to use intelligently the information at his disposal. A ship's officer does not need to become a forecaster—the forecast is issued from the shore—but if he takes the whole message and draws up his own weather map he can be in a much better position to appreciate and interpret the forecast. It is difficult for the meteorologist ashore to word a forecast to adequately cover all situations and all areas of a given ocean. A practical example of the Atlantic Bulletin is reproduced at the end of the article.

One may well ask, when the ship master has his forecast, and has plotted the information and is confident that it is going to be right, " What has he gained ? " It is not easy to be specific about this, but one can without great difficulty envisage situations where he may take action for the safety of his ship, or for the benefit of his owners, as a result of receiving an accurate forecast. He can, at least, warn his owners that he will be missing a certain tide, or that owing to unexpectedly favourable conditions he will catch an earlier tide. In the meat or fruit trade, for instance, such information would be of the utmost value and might save an enormous amount of money. Under certain circumstances he may make an early decision to ease down and avoid punching into a head-sea to no avail, with the realisation that by easing down he will catch a later tide, but which will be, perhaps by way of compensation, a daylight tide instead of a night one. One should also bear in mind the psychological effect upon the master and his officers of knowing it will be fine or foggy or a gale, and the practical value of this information for planning the work of the ship's company or for the care of cargo or even for adjustments of speed.

It is difficult to give much advice as far as single observations are concerned. The single observer can, by intelligently watching his barometer, cloud, temperature and state of sea, do quite a lot to assist himself, and of course this particularly applies in tropical waters, and one must not forget that even a radio set may fail and although we have the luxury of Meteorological Services all over the world every ship is not even fitted with radio. In war-time we have radio silence to contend with. It is important, therefore, that a seaman should be capable of " looking for trouble " and should have a proper appreciation of the visible warnings given by Nature, of the formation of tropical hurricanes, for example, or of general bad weather in temperate zones. The value of knowledge about diurnal range of pressure in the tropics should be stressed ; tables showing this appear in meteorological atlases and in Admiralty Pilots.

As for the mariner making his own forecasts, this certainly can be done at times, and we have in the Meteorological Office seen some very good results from ships' officers' own forecasts. Atlantic liners in particular seem to have done well with the use of the analysis. It is helpful if masters are taught something about the rudiments of forecasting ; for instance, such items as the fact that a depression tends to move in the direction of the " straight " isobars of its warm sector, that the rate of fall of a barograph is an indicator of its movement, and that if, for example, there is a large anticyclone over western Europe, a depression in the Atlantic may either tend to move very slowly or else be deflected quite quickly to north or south or even take a retrograde movement.

The remark in the syllabus which reads, " when one international system is brought about ", does not apply at present, since the introduction of the Washington Code and of the certain other resolutions which were made at Washington have at last achieved real uniformity as far as weather information to and from shipping is concerned.

Extra Masters

When we come to extra masters the practical side of meteorology should still be stressed, but more physical knowledge is needed than by other candidates, and perhaps the best idea is to relate the lectures on this subject to those of general science, and indeed to electricity and navigation. It seems that the general science syllabus is very readily applied to the meteorological syllabus and one should therefore expect an extra master to appreciate the physical principles underlying the variations of pressure and temperature in the atmosphere ; of adiabatic and other lapse rates ; of the reasons why inversions occur ; of the physical processes underlying water vapour, fog, cloud and the like ; of convection and subsidence ; convergence and divergence. He should have an elementary idea as to the importance of upper air as well as surface observations, as far as the study of weather is concerned. He should also appreciate the existence of the troposphere and stratosphere and of the reflective layers (heaviside layer) in the upper atmosphere, and know something of the rudimentary theory of aurora and the significance of magnetic and electrical storms. He should have a broader appreciation of the possibilities of controlled ventilation of cargoes, of wind structure and the possible effects of violent gusts upon a tender ship with the wind broad on the beam, of the formation process of salt water ice and of the danger to a ship's stability of ice accretion (in fact, a master should certainly know about this). He should have an appreciation of the meteorological limitations of radar.

I do not think there is anything one need add here about winds, currents and ice limits, except that the extra master's knowledge needs to be greater than that of a master upon this subject, but at the same time one cannot expect him to carry about in his head the name of every current in the ocean. I think that what should be aimed at is a broad idea of the general circulation, and as far as wind systems are concerned a broad appreciation of the fact that, apart from the monsoon areas, conditions all over the world more or less follow a steady plan. At the same time he should know something about the more important local winds such as harmattan, bora, pampero, norther, etc. He should appreciate the meteorological effect upon the tides in certain areas, e.g. the surges of the North Sea, the occasional disastrous flooding of the Hooghli area with strong southerly winds, the great lowering of the River Plate area with north-westerly winds, etc.

Meteorological observations and instruments

From the purely meteorological viewpoint, accuracy in reading instruments and taking observations is obviously important, but this is valuable also to the seaman himself. Reading of wet and dry bulb thermometer, barometer and air temperature all have practical value to the seaman, as mentioned before. Some of the difficulties in making instrumental observations at sea are as follows :

BAROMETER. To get the correct reading of a barometer which is pumping a lot, it is the mean of the readings that is required. An aneroid can, of course, be used to minimise pumping, but the ordinary ship's aneroid is not usually compensated for temperature and therefore tends to be inaccurate compared with the mercurial instrument. An aneroid should be compared with the standard instrument whenever possible, and it is helpful if a check of readings over a range of pressure as well as over a range of temperature is kept in the ship. An interesting point is the possible transient effect upon a barometer reading if the chartroom door is left open while the reading is being made—an increase or decrease in pressure arising, dependent upon whether the weather or lee door is open.

AIR TEMPERATURE AND HUMIDITY. The dry and/or wet bulb thermometers should be exposed in the screen in such a position that as much free air as possible from outside the ship flows through the screen. Otherwise the reading is bound to be an untrue one and affected by various local heating effects aboard the ship. Generally the screen should be hung to windward. Having in mind the difficulties of exposing the screen we hope to introduce an aspirated psychrometer shortly. This instrument has a hand-operated fan which ensures a steady draught of air past the thermometers in the instrument.

SEA TEMPERATURE. Taking sea temperature accurately is always difficult and the canvas bucket has been shown to be liable to cause grave errors. The only way of overcoming the difficulties is to read the temperature immediately the water is hauled up on deck and the thermometer has been in the water about thirty seconds. A new type of insulated bucket to avoid these errors is being experimented with but has not yet been issued to ships. We do not normally recommend using intake temperature as we have no check on the accuracy of the thermometers used for this purpose in the engine-room, and there is always a measure of uncertainty as to the temperature gradient between the surface and the intake. In large fast ships it is frequently impracticable to use a bucket, so in such cases we have to accept intake readings.

The " Washington Code "

The Washington Code has been introduced for the sake of achieving world uniformity on land, at sea and in the air. Some of the items ask for greater accuracy than is necessary from the shipping viewpoint, but they appear in the " ship " code for the sake of uniformity.

Y Q $L_aL_aL_a$ $L_oL_oL_oG$ G Nddff VVwwW PPPTT N_hC_Lh C_MC_H
D_sv_sa p p $(8N_sCh_sh_s)$ $(9S_pS_ps_ps_p)$ $oT_sT_sT_dT_d$ 1 $d_wd_wP_wH_w$ ICE c_2KD_1re

Taking the various elements in order it will be seen that there is nothing particularly formidable in this code and it is not very far different from those which have been in use before.

N—the amount of sky covered—is given in eighths instead of tenths and it is felt that this is even easier than the old method of reporting it in tenths.

The wind direction is given in the 0–360 (0–36) form instead of in points (0–32) ; this is in conformity with the method used for upper air observations and, as wind direction is always reported true and not magnetic, this seems to be quite rational.

ff—force of wind—is given in knots instead of in Beaufort, again for the sake of uniformity, but the seaman will still observe it in Beaufort and report it in knots. This does enable interpolation to be made between two different Beaufort forces.

VV—visibility—is given in a new form, e.g. in yards, and it does provide for much greater accuracy than is practicable at sea, but the decade 90–99 in this code is readily adaptable for maritime purposes and we only expect seamen to report in that decade. The reason for the extreme accuracy which can be reported by this code is for aviation purposes.

PPP—three figures have been introduced because it is felt that greater accuracy is needed than was previously asked for.

$N_hC_1hC_MC_H$—As far as cloud types are concerned there is nothing very different from what was asked for before, except that the information refers more to state of the sky than to any particular individual cloud formation. The height of cloud is admittedly a very difficult observation to make at sea and it is also difficult to give much advice as to how it can be done. One can only give general guidance. We hope to eventually have some apparatus available for measuring cloud height aboard ship. Ashore we use small balloons filled with hydrogen or cloud searchlights—but neither of these is very practicable aboard merchant ships.

The group $8N_sC_sh_s$—significant cloud—is not normally expected to be dealt with by merchant ships, although we are very happy if a keen observer does care to report it. It does not seem there is any need, however, for that to be introduced into the examinations, nor the group $9S_pS_ps_ps_p$.

$0T_sT_sT_dT_d$—This group merely asks for the difference between air and sea temperature and the dew-point temperature. The reason we ask for difference between sea and air is that this is basically the factor in which the meteorologist is interested. He does not particularly want to know what the actual sea temperature is but he does want to know whether it is above or below the air temperature. Temperatures should be read to the nearest ·2°F., chiefly with the object of encouraging accurate reading.

$1d_wd_wP_wH_w$—This new wave group has been introduced in order to obtain more useful and accurate information than could be given by merely making a generalised statement such as " moderate sea and heavy swell ".

Wave information is not only of value for synoptic meteorology, particularly in hurricane areas, it is also of commercial value concerning swell in exposed harbours, e.g. on the Morocco and Portuguese coasts. It is also of value for investigating the behaviour of ships in a sea-way and for the operation of aircraft and seaplanes.

The reason we ask for "period" is that this seems to be one of the measurable elements, bearing in mind that period, speed and length are intimately related by the formula speed = wavelength/period. Height is not related directly to any of the other elements and therefore has to be estimated separately.

The ice group needs little comment except that " e ", " orientation of the ice limit ", related to its bearing indicates whether the ship is inside or outside the ice at the time of making the report. This group is merely a convenient method of including ice information in a synoptic report, and it does not absolve a ship from the necessity of making plain language ice reports in accordance with the International Convention on Safety of Life at Sea.

The International Meteorological Organisation

Many resolutions concerning maritime meteorology were adopted by the International Meteorological Organisation at Washington in 1947. These have in mind a desire to achieve uniformity and simplicity and at the same time efficiency. There was international agreement that some meteorological training for ships' officers was necessary, and encouragement to be accurate in their own interests when reporting weather. At the same time all Meteorological Services are bound by agreement to issue adequate information for the protection of shipping and to afford ship masters all assistance which lies within their power.

Atlantic Weather Bulletin

As it seems possible that the Atlantic Bulletin may be introduced into examinations for masters and extra masters some comment on it, together with a plotted example, may be of value.

This bulletin, which is issued specially for the use of shipping, is broadcast from Portishead and consists of six parts. Parts 1, 2, 3, 5, 6 are broadcast twice daily at 0930 and 2130 G.M.T. Part 4 is broadcast only at 1130 G.M.T.

The contents of the different parts are as follows :

Part 1. Storm warnings in plain language. Warnings are issued when the wind is expected to reach Beaufort force 10 or over in the area concerned. When there are no storms in the forecast area that fact is indicated by the words " No storm warnings ".

Part 2. Synopsis of weather conditions in plain language.

Part 3. Forecasts in plain language for areas Biscay, Finisterre and the NE, NW, SE and SW sections of the region of the North Atlantic from 35°N. to 65°N. between 15°W. and 40°W. These forecasts are based on 0600 and 1800 G.M.T. observations and cover a period of twenty-four hours from time of issue.

Part 4. Particulars of pressure and frontal systems, including essential isobars in the International Analysis Code (I.A.C. (Fleet)).

Part 5. Selection of ships' reports based on 0600 and 1800 G.M.T. observations in the form

$$YQL_aL_aL_a \quad L_oL_oL_oGG \quad Nddff \quad VVwwW \quad PPPTT$$

Part 6. Selection of shore station reports based on 0600 and 1800 G.M.T. observations in the form

$$(999II) \quad iiiT_aT_a \quad Nddff \quad VVwwW \quad PPPTT$$

where II is a block number indicating the region in which the station is situated, iii is the station index number and T_aT_a is the dewpoint expressed in whole degrees.

Parts 1, 2 and 3 contain much information that can be used immediately without the necessity of drawing a synoptic chart. However, it is found that the drawing of charts not only gives a far better insight into the weather but assists greatly in the interpretation of the forecasts. The recommended procedure for making the most of the information is as follows :

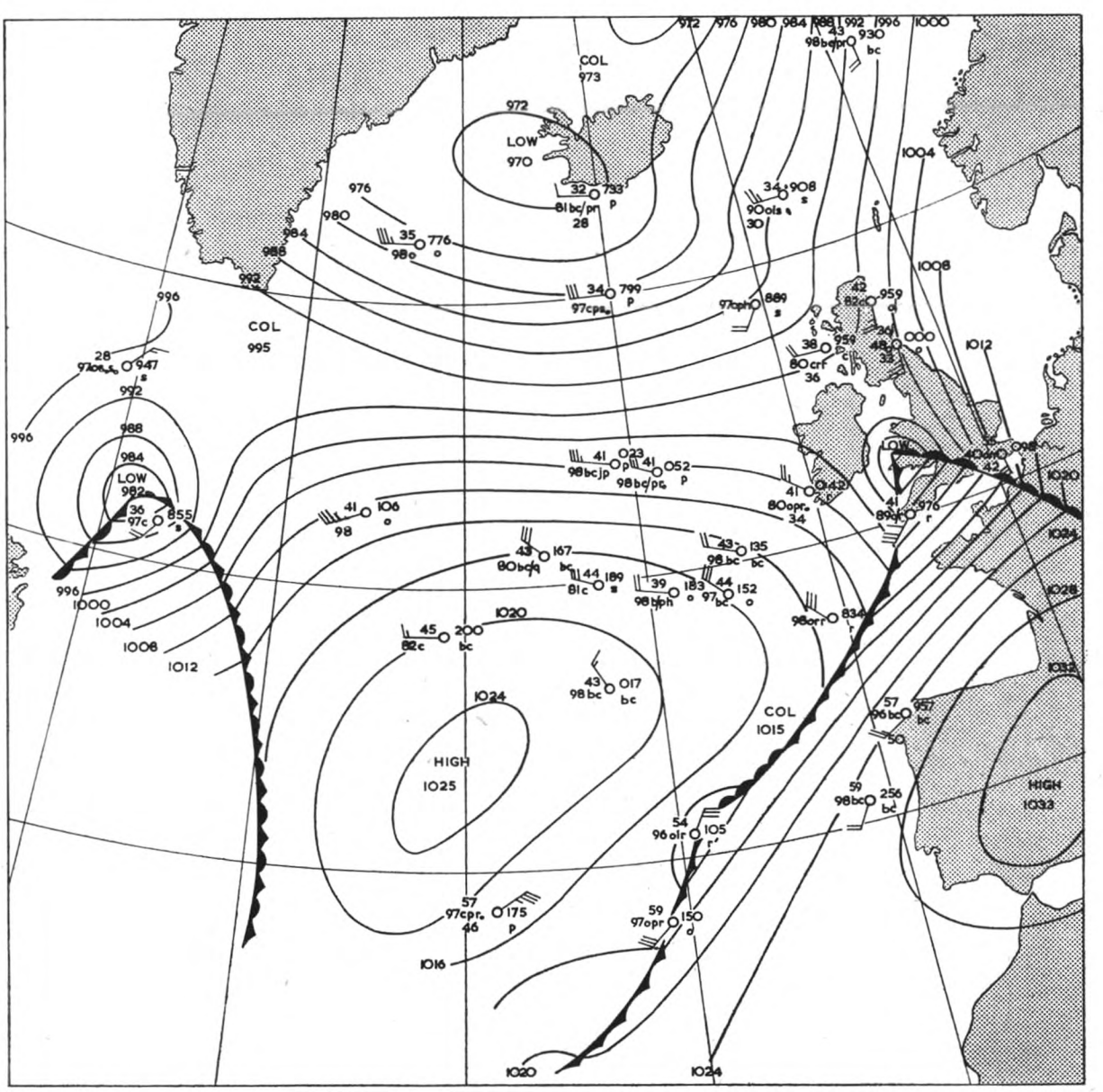
In addition to Parts 1, 2, 3 use Parts 5 and 6 (issued at 0930 G.M.T.) and plot the land and ship station reports. A rough drawing of the isobars *lightly* in pencil will then be possible.

On receipt of Part 4 at 1130 G.M.T. plot the centres of the pressure systems, making any corrections found necessary, and then draw in the fronts, using the information given in the coded message. At the end of this message will be found sufficient position points to enable the main isobars to be drawn. These are checked against the original lines and any intermediate isobars filled in. At 2130 G.M.T. Parts 5 and 6 can again be received and perhaps a new chart drawn in the light of these new observations.

The International Analysis Code, which appears complicated at first sight, will become quite simple after a little practice in its use.

Full details are included in M.O. 509, *International Meteorological Code: Decode for the Use of Shipping;* M.O. 477, *Marine Observer's Guide;* or *Admiralty List of Radio Signals*, Vol. III, Part A.

It is desirable that every student in nautical schools should have a copy of M.O. 509 for his personal use and study. It contains all the essential facts without trimmings.



0600 G.M.T., 9th February, 1949

The relevant parts of this specimen Atlantic Weather Bulletin, which is shown below, are plotted on the weather map on page 80. It will be seen that this gives a comprehensive " picture " of the weather situation in the eastern Atlantic and makes it easier to appreciate the situation and the forecast.

ATLANTIC WEATHER BULLETIN

0600 G.M.T., 9th February, 1949: Forecast and Observations

STORM WARNING

Deep low off Newfoundland probably moving east at 30 knots. Storms force 10 in south and east quadrants.

Depressions over Iceland nearly stationary. Anticyclone centred 43° N., 24° W. moving east.

NORTH ATLANTIC FORECAST FROM 35° N. to 65° N. BETWEEN 15° W. and 40° W. and BISCAY AND FINISTERRE NEXT 24 HOURS.

NORTHERN SECTIONS: Winds west or north-west strong to gale, moderating towards high; storms force 10 in west moving east at 30 knots with rain, otherwise wintry showers with hail and thunder; but otherwise good visibility.

SOUTH-WEST SECTION: Winds clockwise round high, moderate or fresh. Rain spreading from west, otherwise scattered showers. Visibility moderate to good.

SOUTH-EAST SECTION: Winds south-westerly strong to gale, but veering north west and moderating except in extreme south-east. Rain spreading south-eastwards followed by showers; visibility otherwise moderate or good.

SHIPS:

40620	33006	82730	98022	77635	=	40528	35506	82429	98032	10641
40483	31006	72708	82031	20045	=	40349	42706	12403	22715	351–8
40493	18806	22813	98272	18339	=	40408	11006	52115	98011	25659
40346	51406	13626	97031	20261	=	40565	51006	80308	97717	94728
43660	02006	41813	98251	93006	=	40514	47106	72013	97027	85536
40472	10706	83125	98626	83400	=	40600	20006	72725	97858	79934
40538	18706	42928	98808	05241						

STATION REPORTS:

99903	10036	82711	80633	95938	=	06831	71918	82022	95942	
18533	81830	48022	00036		=	79542	81722	40636	09855	
81449	82138	89216	97641		=	95334	83119	80806	04241	
99906	01151	82718	90727	90801	=	99904	04853	42709	81258	73350
99908	00150	42319	96021	95757	=	50646	60531	97808	17557	
99978	01049	60803	98031	26161						

0600 G.M.T., 9th February, 1949: Analysis and Late Observations

ANALYSIS:

	10001	33300	00906	81282	52488	Trough	62158	56065	53085	81170	65237
81268	71105	81389	52056	81209	39208	85125	43315	85233	38038	88095	58428
88073	67186	88015	43155	88031	38002	66950	37397	45405	52457	53487	66457
33267	38225	39208	66150	39208	42148	66450	42148	47086	52056	66150	52056
49001	47055										

SHIPS:

40378	20906	82124	97812	15059	=	40503	14806	32915	98021	13543
40408	19206	80322	96626	10554	=	40462	22606	33309	98011	01743
40511	25606	53127	80181	16743	=	40499	22606	62930	81027	18944
40540	20206	52830	98168	02341	=	40489	15806	33224	97012	15244
40587	10706	82016	97907	89935						

TRANSATLANTIC FLYING FROM PRESTWICK AIRPORT

BY C. J. BOYDEN, B.A.

(Senior Meteorological Officer, Prestwick Airport)

The Organisation for a Flight

It may seem at first sight that, for a major transatlantic air terminal, Prestwick is unnecessarily far north of the centres of population. This impression arises largely from a misinterpretation of the map projections in commonest use. In fact the great circle from Berlin to Newfoundland passes through south-west Scotland, so Prestwick is an obvious intermediate stop for traffic from Scandinavia and much of northern Europe. Furthermore, distance is not the only consideration. Winds are nearly as important to a commercial aircraft as to a sailing ship, and the prevailing winds are such that it is economically desirable on many occasions to cross to America on the north side of the shortest track rather than on it or a few hundred miles to south. Finally, Prestwick itself has weather which is not all that the man on the ground could desire, but which from the flying point of view is practically as good as any in the British Isles. In winter this airport is usually outside the area of slow-moving, cold, smoke-laden air from the industrial districts of the Continent and England ; land fog is rare because of the tempering influence of the sea ; and low cloud from the Atlantic is lifted and broken by the land which almost completely shields the approaches to Prestwick.

The publicity given to the performance of modern aircraft—cruising ranges in thousands of miles, the high maximum speeds and increasing altitudes attained—is apt to give the impression that flying from one place to another is simply a question of filling up with enough petrol and navigating with reasonable accuracy. These are necessary requirements, but form no basis for successful commercial flying. The first consideration for any flight is to ensure a high probability of terminal weather which will permit a safe landing. The second is to choose the route and height which will give the most favourable winds, together with trouble-free and comfortable flying. A saving in the amount of petrol to be carried means that more passengers and freight can be taken aboard, fuel costs are lower and engine wear is reduced. These are among the many considerations which make it questionable whether aircraft ranges greatly in excess of those of today will be needed for commercial use.

While the maximum available payload is subject to a seasonal and other variation, the factors subject to the greatest variability are weather and winds. Thus the major part of the information on which every long flight is planned comes from the meteorologist. The forecaster provides the basic information and advice to the airline representative on the ground, and he in turn submits his decisions, with full supporting details, to the captain of the aircraft. A very complex meteorological organisation is involved, but an article of this length allows only a sketchy picture—little more than can be seen over the forecaster's shoulder.

A station such as Prestwick maintains regular synoptic charts at three levels —at the surface, at 700 mb. (about 10,000 ft.) and at 500 mb. (about 18,000 ft.). Flights by jet aircraft call for sequences of charts at 300 mb (about 30,000 ft.), and the demand for forecasts for flights at this level will

doubtless increase. The network of observations used on most charts extends from Greenland to the northern fringe of the trade-wind belt, and from the Pacific coast of North America across to eastern Europe. Eight surface charts are drawn daily, together with four at each upper level, though in all cases alternate charts (called " intermediate ") contain rather fewer observations than " full " charts. In addition, each upper air ascent is plotted on a tephigram as an aid to the study of the vertical structure of the atmosphere.

By courtesy of British Overseas Airways Corporation

Fig. 1
A Constellation aircraft off on a Transatlantic flight

The observations on upper air charts are of a density comparable with that on the surface charts. They are based mainly on pressure-heights, temperatures, humidities and winds obtained from radio-sondes launched from land stations and Ocean Weather Ships. These reports are supplemented by hourly reports from transatlantic aircraft. The continuous supply of up-to-date reports involves an intricate network of channels of communication. But it is sufficient here to say that most of the European and British reports are received by teleprinter from the Central Forecasting Office at Dunstable, while North American data come by point-to-point W/T from Montreal to Prestwick ; also by radio-teletype from New York via Paris and Dunstable. Many of the aircraft reports are received direct by W/T or R/T, and in addition regular reports and landing forecasts from Continental terminals are intercepted on W/T broadcasts from the various countries.

The stage has been reached where the forecaster cannot complain of the shortage or inadequacy of land reports, and over the Atlantic, thanks to the combination of reports from merchant ships and ocean weather stations, the coverage is good, though naturally less full. Consequently, reliability of the analysis of completed charts is of a high order, so the forecaster starts with a comprehensive picture of the structure and past movements of the atmosphere for more than half-way up to the stratosphere. With this background he can foresee most of the subsequent developments, and the major difficulty is that of accurate timing. Errors of timing become much more vital as the period of a forecast increases, and for transatlantic flights preliminary forecasting is done for as much as thirty-six hours ahead of the latest completed chart.

Three hours before a westbound aircraft is due to leave Prestwick the airline representative has decided, in consultation with the forecaster, on the route and flying height he will advise the captain to take. The charts on which the calculations are based are " composite ", i.e. are not appropriate to a fixed time at all points along the track. In the region of Prestwick the weather chart shows the situation as it is expected to be at the time of departure, whereas the analysis over eastern North America is an estimate for the time of arrival, some twelve hours later, with, of course, a gradual adjustment for the intermediate times along the route. These composite charts are drawn for the surface and two upper levels and are thus mutually consistent.

If the forecast charts show headwinds to be very strong, on these grounds alone it may be advisable to head well north of the great circle and then turn south-westward in mid-Atlantic. Or it may be worth crossing in two stages, with a stop in Iceland or even the Azores. If the adverse winds increase rapidly with height it may pay to fly below the more usual level, but this must be assessed in relation to cloud amounts, cloud tops, ice accretion, etc. After flight times have been worked out the plans may have to be cancelled because of a forecast of less favourable landing conditions in Canada than had previously been expected. These terminal forecasts, by the way, are the only part of the forecast which is not the work of the main departure meteorological office. Each airport office (or parent meteorological station) produces its own landing forecast, and these are transmitted as routine every six hours (with amendments at intermediate times as necessary) to all other offices concerned.

When a decision has been reached on these points, even if only a provisional one, the airline representative works out the details of loading, the fuel requirements, etc., and the forecaster continues with the preparation of the forecast. The next stage is from the composite charts to the complete wind and weather forecast. Winds and temperatures are given in zones of 5° of longitude, and usually for five heights—a total of over fifty sets of values for one transatlantic flight. The variety of heights covers the possibility that the captain may wish to change altitude during flight. Above the table giving these winds a composite vertical cross-section is drawn showing the structure and extent of the clouds along the route, the heights of bases and tops, the freezing level, regions of probable ice accretion, where turbulence and precipitation are to be expected, etc. The synoptic charts, this cross-section and, finally, copies of the forecast for the destination and alternates are made up into a folder which the pilot will take with him on the flight.

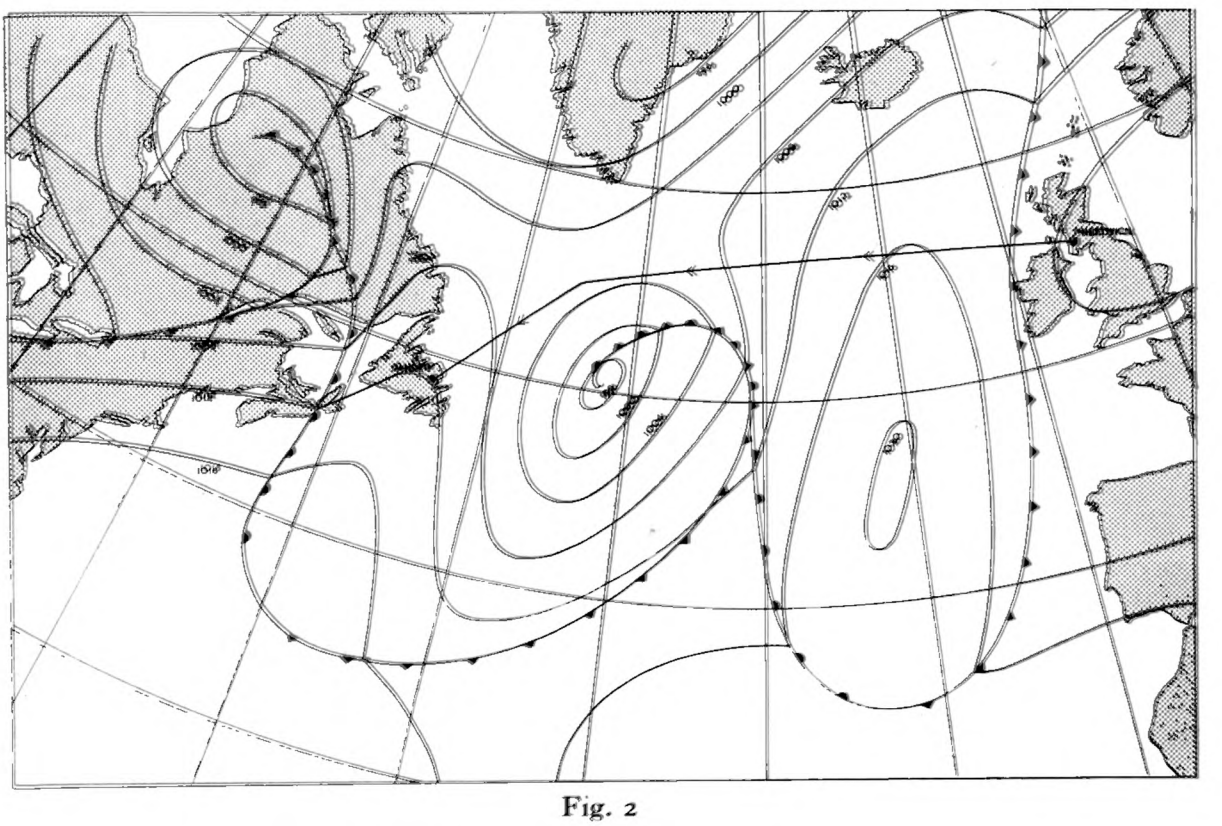


Fig. 2

Fig. 2 shows a composite surface chart on which a great circle track from Prestwick to Gander (almost a straight line on this map projection) would have taken the aircraft along the occlusion of the depression east of Newfoundland. To avoid this, and to use slightly less unfavourable winds, a composite track was chosen through 55°N. 45°W.

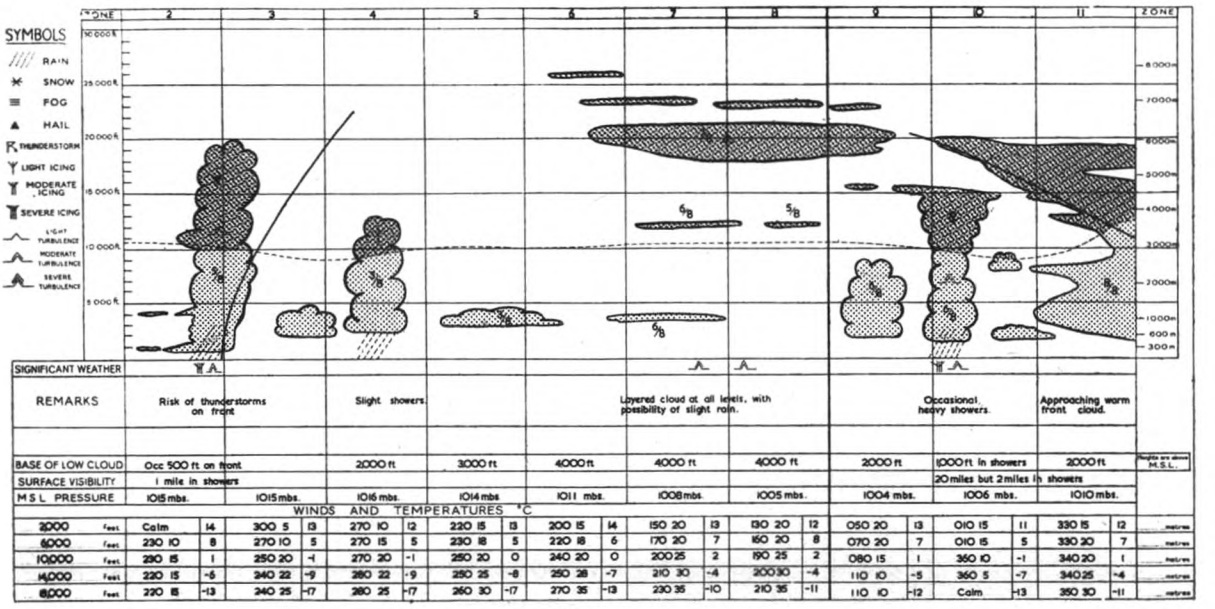


Fig. 3

Fig. 3 shows the cross-section for this flight, with Prestwick on the extreme left and Gander on the extreme right. At the end of the first zone is shown the towering cloud of the cold front off Ireland. The amount is given as 5/8,

so the worst weather can probably be avoided. Its most dangerous feature is the severe icing, but the freezing level, shown by the broken line, is just above 10,000 ft., so there is no risk below this level. There is then good weather until the last two zones, though just beyond half-way the aircraft passes through the northern fringe of the cloud system of a depression. Gander itself was nearly cloudless when the flight started, but the cross-section shows the warm front which is expected by the time of arrival.

The captain of an aircraft has much the same authority and responsibility as the master of a ship. The final decision as to the route and flying height is his, and he is at liberty to postpone the flight if he considers he would otherwise be taking an undue weather risk. But such is the co-ordination with his own ground staff and the meteorologist that he is unlikely to disagree substantially over the conclusions that have been reached. The meteorological briefing gives him the opportunity for a full discussion of the more vital points of the forecast, and it enables the forecaster to indicate possible alternative weather developments. The value of this is that, when during the flight the weather is found to differ from that forecast (as it is bound to do in some of its complex detail), the captain is in a position to recognise the nature of the differences and if necessary to make allowances for them.

The departure of an aircraft does not bring to an end the forecaster's responsibilities. For some hours a watch is kept on the weather in relation to each individual flight, and in this the closest co-operation between the company representative and the forecaster is essential. Every hour the aircraft sends out a position and weather report, so providing a check on the forecast wind and weather. Any significant weather advice is radioed to the aircraft, and the captain in turn may ask for the latest reports and forecasts, including upper wind observations and fixes from weather ships.

This flight watch continues for some six hours, until about the time when operational control passes from Great Britain to Canada. From that point Gander takes over the meteorological flight watch, just as Prestwick, Shannon or London takes responsibility for each incoming aircraft in the eastern North Atlantic when it enters their zone of responsibility. The Canadian Meteorological Service has received by W/T in code the essentials of the forecast handed to the captain at Prestwick, and knows the aircraft was about to leave Prestwick.

The Contribution by Atlantic Shipping

The ship's officer who makes routine weather observations may feel that his contribution to forecasting is a humble one, particularly where aircraft operations are concerned. The aircraft are flying at anything from one to four miles above the sea, perhaps above or in a mass of cloud, and probably on a track hundreds of miles to north or to south of his ship. Nevertheless there is no doubt that a few days in a major meteorological office would convince any seaman of the weight that is given to his reports.

It is necessary to realise that when a forecaster has to decide on conditions twenty-four hours ahead along a certain route, present reports on the route are of no special interest. What he needs more particularly are reports away from the route. A Prestwick forecaster never issues a forecast to Bermuda, yet he would feel handicapped if he were deprived of reports from that area. The reason for this is not simply that the weather at Bermuda

today may be off Newfoundland tomorrow. Indeed, this is never completely true : weather certainly moves with the wind, but substantial changes take place in it during the period. The aim of the forecaster's working chart is to produce an analysis over a fairly self-contained area of weather activity. His chart is a jig-saw puzzle with pieces of varying size. A ship report in a seemingly uneventful region may be the only " fix " on one of the pieces. Its contribution to the analysis in a more distant area may be much more important than what it tells about the weather in its own locality. To take an everyday occurrence, the forecaster may know from previous history the orientation of a front but may lack a precise " fix " on its present position. A significant report from a ship somewhere near it may then serve to locate it along its whole length. While the weather ships, with their surface and upper air reports of the highest quality, are undoubtedly the mainstay of Atlantic analyses, much can happen to a front or depression in the wide areas between them, and for this reason reports from merchant ships will remain invaluable.

The next paragraph illustrates the way in which ship reports contribute to the analysis of charts. It may, however, be less clear how the ingredients of a ship report help an aircraft flying at 10,000 ft. to complete a twelve-hour flight within about twenty minutes of the estimated time of arrival. The connection here lies in the relationship between the surface and the upper air charts. A 5,000 ft. chart looks rather like a surface chart. A 10,000-ft. chart might be described as a blurred version of the surface one, while at 20,000 ft. the relationship is often visible only to the experienced meteorologist. Nevertheless the nature of the relationship betwen different levels is the basic factor in constructing correct charts. There is a continuous process of building up from one level to another and down again to the surface so as to produce mutually consistent charts through gradual adjustment. So long as ships help to maintain the accuracy of the sea-level chart they are materially contributing to the safety, punctuality and economy of transatlantic flights.

How Ship Reports are Utilised

When a ship report is being studied it cannot always be foreseen which reported element will prove to be the most significant, but most forecasters would agree that wind direction and speed are on the average the most vital. For example, the formation of a new " wave depression " may first be indicated by a slight backing of wind, coupled with a decrease or increase of speed, with little other change in the observation. Such a development can usually be foreseen, but without an actual observation the exact positioning, and more particularly the timing, are very difficult.

Pressure and pressure tendency (with allowance made for the ship's movement) are perhaps the next most commonly used indications. They are particularly useful when the ship can be followed from chart to chart. It is rather to the credit of the observer that wind observations prove more sensitive tools for the purpose of chart analysis than the instrumental recordings of pressures.

Dew-point, in relation to air and sea temperatures, is another element which is used to a very large extent in the analysis of the atmosphere—to an extent, in fact, which might shock the less conscientious observers.

Some hypothetical ship reports have been plotted in Figs. 4 to 6 to illustrate the normal reasoning involved in chart analysis. (Little more than pressures, the winds and dew-points of these particular reports have been plotted.) This reasoning involves deductions and detection, for it is an important fact that by the time ship reports reach the forecast room they have often developed errors due to transmission and retransmission.

The basic method of all chart analysis is to draw the *expected* picture, using the observations to adjust exact positions and to indicate the start of *expected* developments. Fig. 4 shows a cold front drawn in the expected

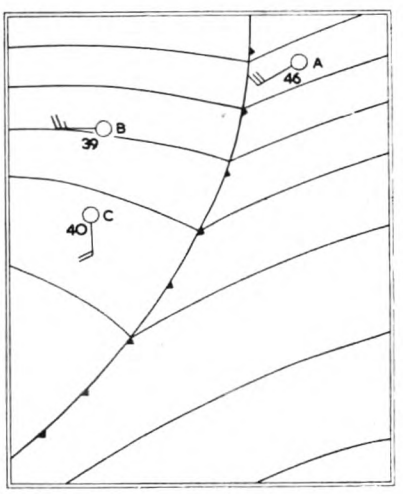


Fig. 4

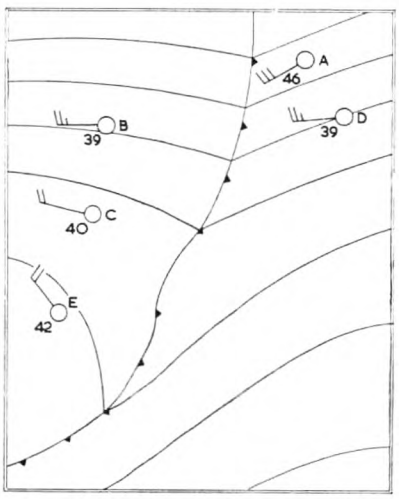


Fig 5

position as modified by the three available ship reports. It was first necessary to recognise an error in ship " C ". The wind as reported would not fit the isobars on either side of the front, though it was more appropriate to the warm air (to right of the front) than to the cold ; nevertheless the dew-point is clearly that of the cold air, so it is very probable that a wind of 280° has turned into 180° during transmission.

Fig. 5 shows the same chart at a later stage, with the wind on ship " C " amended by the forecaster. The reports from ships " D " and " E " have now arrived. " D " was a little puzzling at first because the wind direction was a bad fit with the isobars and the dew-point was low. It would have fitted well in position " B ", for example, then suddenly it was noticed that it was a second version of ship " B " with a 10° longitude error.

Ship " E " provides valuable information if its wind direction is accurate, for this shows that the isobars in this region bend farther south by the time they intersect the front. In other words, a wave depression is probably forming on the front east of ship " E ", the closed isobars and stronger winds south-east of " E " blowing the front well forward in that region.

It must not be forgotten that the evidence for the wave is solely the wind direction reported from one ship, but Fig. 6 shows a third stage in the drawing of our chart, with full confirmation from the latest arrival, a report from ship " F ". Three elements reported by " F " are significant. The wind direction shows the southward bending of the isobars as observed at " E ". The rather strong wind confirms the crowding together of the isobars in the region of " F ". Finally, the pressure in the region of " F " is falling

fairly fast.* A pressure fall of 1 mb. in three hours is not in itself large, but the movement of the ship in the last three hours would have given a rise of 2 mb. if the isobars were stationary, so the corrected pressure fall as shown by a fixed barometer would have been 3 mb. in three hours.

Fig. 6 shows the final drawing with the erased positions of the front shown by broken lines. From this drawing alone the forecaster would expect the depression to move north-east and deepen.

The problem discussed in the preceding paragraphs is not based on an actual set of observations, but the reasoning is typical of that employed

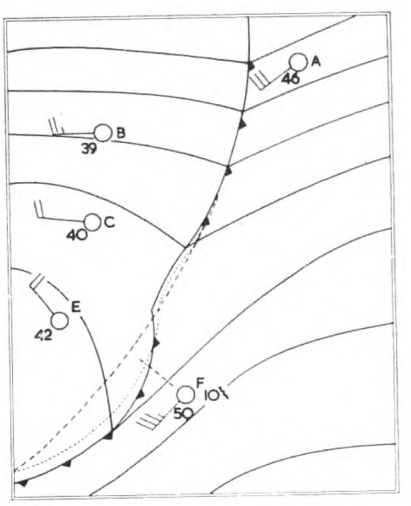
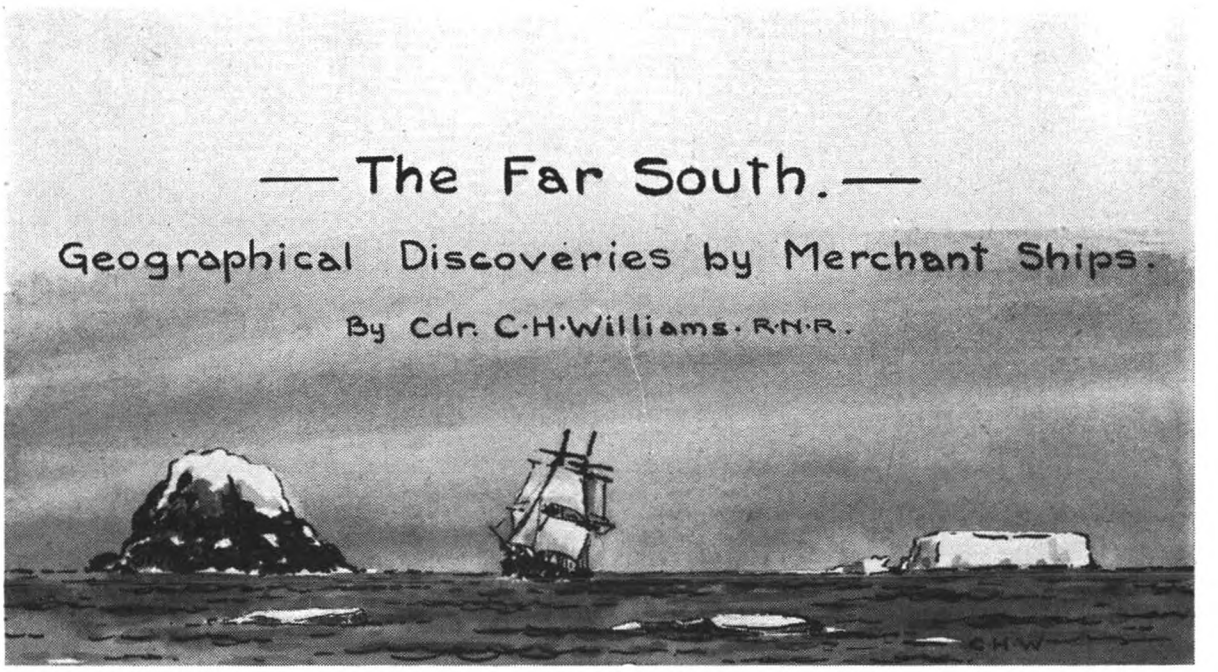


Fig. 6

almost every day on Atlantic charts. The purpose of this example is to illustrate how dependent the forecast is on a reliable standard of ship observations and their accurate coding and transmission.

To readers who know little of commercial aviation this article may have introduced a new conception of the part played by weather forecasting. If a seaman knows what weather to expect he can make certain preparations to meet it, but with most weather hazards he knows he must face up to the hardship and disturbance. They can be anticipated, but not avoided. In flying the problem is entirely different. The duration of the trip is no longer than the period of a reasonably accurate forecast, so right from the start a detailed plan is made to side-step the worst weather and use the most favourable winds. Ships have little defence against the fury of Atlantic weather, but thanks largely to the reports they radio, we are able to send aircraft safely through the weakest parts in the barrier of storm and cloud when crossing that ocean.

* The symbol " 10 " at " F " in fig. 6 indicates a fall of 1 mb. in 3 hours.



PART II

Part I of this article appeared in the January, 1950, *Marine Observer*.

Captain John Biscoe, in the sealing brig *Tula*, 148 tons, owned by Messrs. Enderby & Sons, sailed from Berkeley Sound in the Falkland Islands on the 27th November, 1830, in company with the cutter *Lively*, Captain Avery.

During fog on the 9th December, while hove-to in a gale and amongst ice, the vessels parted company, but rejoined on the 14th. They proceeded to the eastward and visited the South Sandwich Islands in their quest for seals. Like Weddell, Biscoe also searched unsuccessfully for the Aurora Islands, which were supposed to have been discovered by the Spanish ship *Aurora* in 1762, when their position was laid down as lat. 53° 15′S., long. 47° 57′W. There are no islands in that position. The two ships left the vicinity of the South Sandwich Islands on the 1st January, 1831, and continued their voyage to the eastward. In lat. 59°S. they came across firm field-ice and coasted along it unable to get to the southward.

On the 17th January, in lat. 60° 12′S., long. 7° W., however, they at last were able to steer to the southward with no ice in sight. By noon on the 21st they were in lat. 66° 16′S., long. 0° 24′W., and in open water, although many bergs had been passed during the last few days.

That afternoon they saw the appearance of distant land. (This was evidently that part of the Antarctic continent now known as Queen Maud Land.)

Biscoe continued making to the southward, encountering much field-ice, which he coasted along to the eastward. From the 7th February the ice edge trended NE, and Biscoe almost despaired of getting any farther to the southward that season.

During a very severe gale from the SE with thick weather, on the 15th February, the little ships again lost each other, but on the 18th Biscoe sighted the cutter at a great distance to the NW.

On the 20th February they crossed Captain Cook's 1773 track and noted that the ice was in the same position as in that year.

Frequent easterly winds, which rather surprised Biscoe, prevented much progress. (Biscoe's experience, like that of most voyagers in the southern oceans, had been mainly of the westerly winds so common there. Near the mainland of Antarctica, however, easterly winds are more frequent. According to the *Antarctic Pilot*, a year's observations, 1902–1903, at the "Gauss" winter station, Queen Mary Land, in lat. 66° 02′S., long. 89° 54′E., showed that easterly winds represented 55 per cent and SE 12 per cent of those observed. SW, W and NW winds together represented only 14 per cent.)

By the 25th February, 1831, the *Tula* and *Lively* were in lat. 66° 29′S., long. 45° 17′E., and amongst field-ice and bergs. Biscoe stood to the southward again and made out the appearance of land between the bearings of ESE and WSW with much ice stretching to the NE.

The main body of the ice he likened to the appearance of the North Foreland and estimated it to be as high.

Three days later, at 4 p.m., land was sighted to the southward and was later clearly distinguished as such. The longitude was 47° 20′E. Biscoe recorded much satisfaction at sighting new land and made great efforts to close it. To a point of land which he estimated lay in lat. 66° 25′S., long. 49° 18′E., he gave the name of Cape Ann. The new land he had discovered he named Enderby's Land, after the owners of the vessels. One of the high mountains he sighted is now known as Mount Biscoe.

They survived another severe SE gale of hurricane force in which the ships were damaged and so badly iced up as to be almost unmanageable. The ships again lost sight of each other on the 6th March. Biscoe once more stood to the southward and on the 16th March again sighted Cape Ann and some very high mountains. After about three weeks of further attempts to approach the land, his crews by now being ill and two men injured, and the *Tula* a mass of ice, he decided to get to the northward; the lateness of the season and the long and dark nights made work amongst the ice very dangerous.

Biscoe proceeded to Tasmania to refit his ship and to land his sick men. Two of his men had died on the passage. The *Tula* anchored in the Derwent on 10th May, 1831. The cutter *Lively* did not rejoin the *Tula* in the Derwent until the following August, having put in to Port Philip, New South Wales. They had traversed about 180° of longitude in the far south, largely in uncharted waters, about 80° of it south of lat. 60°, and had discovered what we now know to be part of the great Antarctic continent. Certainly a notable achievement.

In the brig *Tula*, with the little cutter *Lively* in company, Biscoe sailed again on the 10th October, 1831, and after visiting the coast of New Zealand and Chatham and Bounty Islands, sealing, again stood to the south-eastward. To quote his journal: "On the 4th January, 1832, were in lat. 56° 26′S., long. 172° 45′W., with light variable winds, and being now in the latitude in which I had hopes of falling in with land, I determined to keep within this parallel for some degrees to the eastward."

His object was to search for the Nimrod Islands, which he did for several days without success. (The group has been searched for on a number of occasions since then but has not been found. They were first reported by Captain Eilbeck of the *Nimrod* in 1828, and by a coincidence were searched for many years later, in 1909, by another *Nimrod*, Captain J. K. Davis.

After remaining on the charts for over a hundred years, and being mentioned in the *Antarctic Pilot* under the heading " Doubtful Islands ", they are now, by the latest Supplement, 1945, to be deleted.)

In the hope of finding new land, Biscoe kept well north of the known track of Captain Cook for about three weeks and then steered to the southward, crossing Cook's track in about lat. 60°S., long. 135°W. On the 25th January they passed several bergs and a few days later were among large clusters of them and much loose ice. By the 3rd February they were in 65° 32'S., 114° 09'W. The little cutter *Lively* was now short of water (it was evidently not known then that ice from icebergs, melted, will produce fresh water); also her sails were in such bad condition that it was decided to make as quick a passage to the eastward as possible. Biscoe was convinced that even if land should be found to the southward in this longitude it would be unapproachable on account of ice, and would therefore be of no benefit to the seal hunting. It is worthy of note that the Admiralty Chart of Antarctica is still blank in this section, the coast never having been charted. The recent American expedition under Admiral Byrd may rectify this.

On the 15th February, 1832, at noon they were in lat. 67° 01'S., long. 71° 48'W., and a few hours later saw land bearing ESE at a considerable distance. The next day at noon they were close in, with the land about three miles to the eastward.

This new land Biscoe named Queen Adelaide Island. He believed it to be the farthest known land to the southward, evidently not having heard of Captain Bellinghausen's discovery in 1820–21 of Alexander I Island, some ninety miles farther south. Adelaide Island is about sixty-eight miles long and of a most beautiful though desolate appearance, with several sharp mountain peaks, the highest rising to a height of over 7,000 ft. High mountains were also seen to the southward and to the eastward, estimated as being at about ninety miles distant, which must have been on the mainland, since called Graham Land.

Standing to the northward and eastward Biscoe discovered several small islands similar in appearance to Adelaide Island. One of these he named Pitt's Island. This group, now known as Biscoe's Islands, he took formal possession of in the name of His Majesty King William IV, naming the highest mountain in view Mount William. Its position was determined as lat. 64° 45'S., long. 63° 51'W.

After examining the islands for seals, but without success, the *Tula* and *Lively* proceeded to the northward and on the 29th February, 1832, sighted Smith's Island in the South Shetlands. This was the island discovered during a passage round Cape Horn in 1819 by Captain William Smith in the English brig *Williams*. It was first landed on by Captain Weddell in 1820, and had also been visited by Captain Foster, R.N., in H.M.S. *Chanticleer* in 1829. Foster named the highest peak Mount Beaufort, presumably in honour of Admiral Beaufort of the Beaufort wind scale, who was at that time Hydrographer of the Navy. The mountain is now, however, known as Mount Foster. Biscoe proceeded to New Plymouth harbour in the South Shetlands, where he found the sealing schooner *Exquisite* of London, Captain Kellock. A week or so later the *Tula* was nearly lost in this anchorage owing to a tremendous swell setting in, causing her to strike the ground heavily several times, badly damaging the rudder.

After carrying out repairs Biscoe sailed again with the *Lively* in company and arrived at Berkeley Sound in the Falklands on the 29th February, 1832, from whence he had sailed in November, 1830. Near the Falklands he had parted company with the cutter *Lively*. Later on it was learnt that the *Lively* had been wrecked and lost on Mackays Island in the Falklands, the crew, however, being saved.

John Biscoe had completed a remarkable voyage : circumnavigating the globe, mainly in high southern latitudes, and making two important discoveries of land at a great distance one from the other. He had added much to geographical knowledge and had reached the highest southern latitude, with very few exceptions, that had until then been attained. He and his crews had suffered considerable hardship and much danger, even for such a tough job as seal hunting in the far south in small vessels like the brig *Tula* and the cutter *Lively*.

Recently (December, 1947) the memory of John Biscoe has at last been suitably honoured by his countrymen by his name being given to a vessel destined for service in the far south. She is an American-built wooden motor vessel, which during the war was the boom defence vessel H.M.S. *Pretext* and now renamed *John Biscoe*. She will operate for the Falklands Islands Dependencies Survey, visiting the British bases in the Antarctic. A new vessel for the Antarctic whaling fleet has also been named *Biscoe*.

The *Venus*, Captain Samuel Harvey, a British sealer and whaler, visited Macquarie Island in 1830 and then pushed south as far as lat. 72°S. in the Ross Sea ; the farthest south reached in that area at the time.

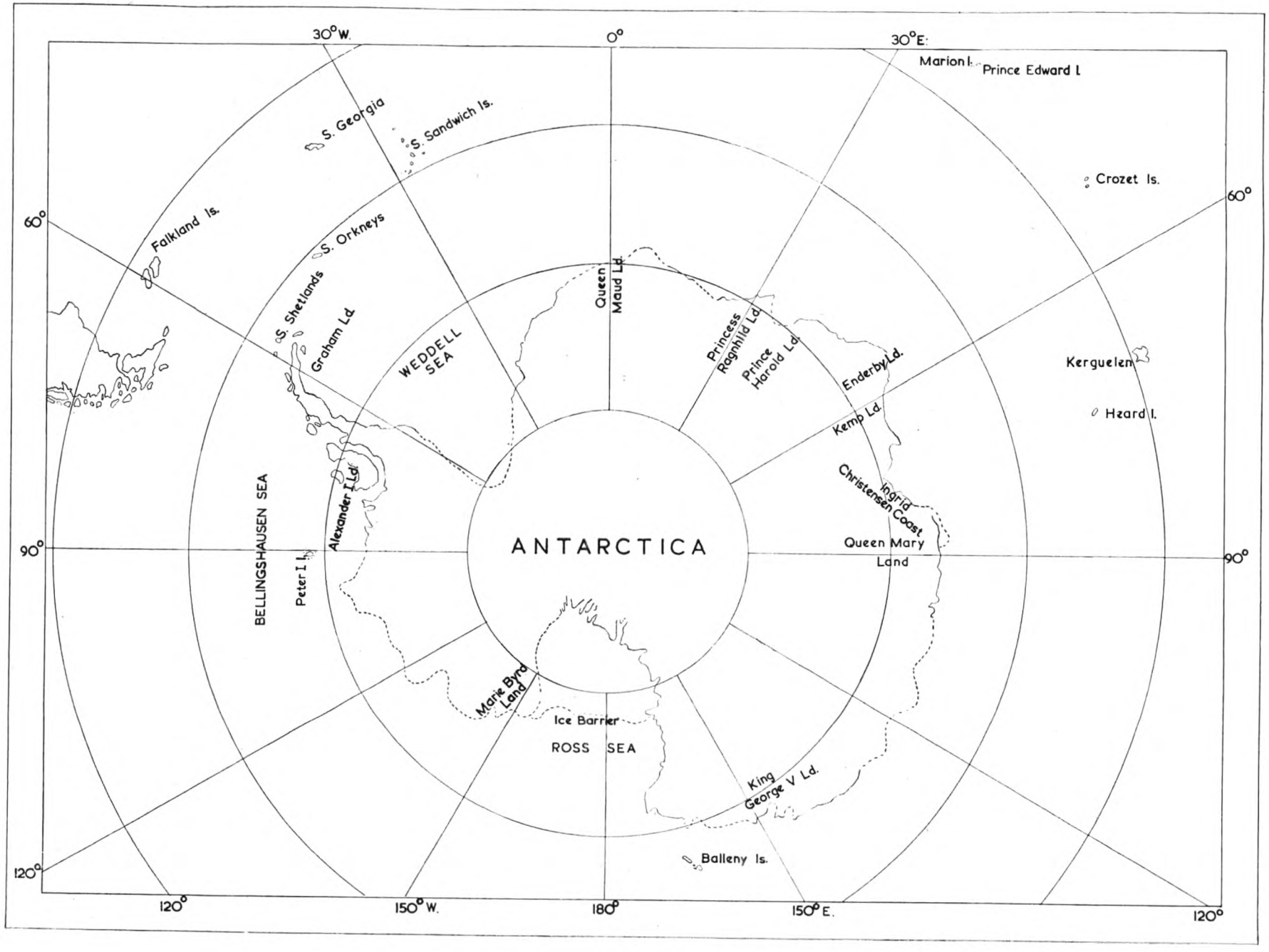
In 1833 Captain Peter Kemp, in one of Enderby's sealing brigs, the *Magnet*, 148 tons, reported sighting land in about lat. 66° 36'S., long. 59° 08'E. Few details of the voyage are known. Kemp sailed from London in July or August, 1833, and after a call at Kerguelen left there in November for the south. Pack-ice and bergs were met in about lat. 60°S. and on the 26th December, Antarctic land was sighted. It is known as Kemp Land. On the way south from Kerguelen he had sighted land in about 52°S. This was probably Heard Island.

The London firm of Enderby & Sons in 1833 planned a voyage to follow up the discoveries made by Biscoe and others. The Admiralty and the Treasury agreed to assist, on condition that a Naval officer accompanied the master.

The ships chosen were the *Hopeful*, of 129 tons, crew of twenty-two, and the *Rose*, 101 tons, crew of sixteen. John Biscoe was master of the *Hopeful* and the Naval officer was Mr. Henry Rae, Master, R.N., who sailed as supervisor. The plan appears to have been to penetrate as far south as possible in the Weddell Sea area.

Few details of the voyage are known, but it seems that Biscoe and Rae did not see eye to eye, and at some stage in the voyage south, probably in the Falklands, Biscoe decided to leave the venture. The ships proceeded south and sought a passage in about long. 30° or 40°W. into the Weddell Sea. It appears to have been a year of heavy pack-ice and the ships were unable to penetrate beyond lat. 60° 17'S. Here the *Rose* was beset and crushed in the ice ; her crew were rescued by the *Hopeful*. Rae then abandoned the voyage and returned to England, arriving in London in May, 1834.

Another notable voyage in the far south, made by two small merchant


30°W.
0°
30°E.
60°
90°
120°
120°
150°W.
180°
150°E.
120°
Marion I.
Prince Edward I.
Crozet Is.
Kerguelen
Heard I.
S. Georgia
S. Sandwich Is.
Falkland Is.
S. Orkneys
S. Shetlands
Graham Ld.
WEDDELL SEA
Queen Maud Ld.
Princess Ragnhild Ld.
Prince Harold Ld.
Enderby Ld.
Kemp Ld.
Christensen Coast
Ingrid
Queen Mary Land
BELLINGSHAUSEN SEA
Peter I I.
Alexander I Ld.
ANTARCTICA
Marie Byrd Land
Ice Barrier
ROSS SEA
King George V Ld.
Balleny Is.

ships, was that carried out by Captain John Balleny in the sealing schooner *Eliza Scott*, of 154 tons, in company with the cutter *Sabrina*, 54 tons, Captain Freeman. They were owned by Messrs. Enderby and others.

The two vessels left London on the 16th July, 1838, and after calling at New Zealand sailed for the sealing venture on the 7th January, 1839. The owners had instructed Balleny to push to the southward in the hope of discovering new land.

The following short account of their voyage and discoveries is based on the journal of John Balleny and on some notes thought to have been made by his chief mate, Wm. Moore, or by the second mate, John McNab. The *Eliza Scott* and the *Sabrina* sailed from New Zealand on the 7th January, 1839. They anchored in Perseverance Harbour, Campbell Island, lat. 52° 33′S., long. 169° 09′E., on the 11th January, where they chanced to meet Captain John Biscoe in the sealing vessel *Emma*.

By the 28th January the *Eliza Scott* and the *Sabrina* were in lat. 59° 16′S. long. 173° 20′E. Fog and strong indications of the vicinity of land, such as seaweed, birds and a branch of a tree, made it prudent to heave-to until it cleared. When this occurred there was neither land nor ice in sight, so they continued their course to the SSE.

A few days later, in 63° 37′S., 176° 20′E., they crossed the track made in 1820 by the Imperial Russian corvette *Vostok*, Captain Bellinghausen, on his voyage of circumnavigation of the southern hemisphere.

Here Balleny met the first iceberg, and pushing on south he found the main body of the pack-ice in lat. 69°S., some 220 miles farther south than it had been in 1820.

Working to the NW to clear the ice they observed the water to be much discoloured. They also saw many whales, sea leopards and penguins. Contrary to Balleny's hopes the wind was strong from W, with much fog. Similar conditions with dirty green-looking water continued until the 9th February.

At noon that day they saw the appearance of land to the SW and steered towards it. By 8 p.m. they were within five miles of the shore and also saw high land bearing W × S. Several islands were discovered and Balleny made the western point of the middle island to be in lat. 66° 44′S., long. 163° 11′E.

On the 11th February the weather cleared and he made out land of a great height bearing WSW. He estimated its height as 12,000 ft. They found the islands completely ice-bound and could find no proper beach nor landing place. Captain Freeman, however, at the expense of a ducking, did manage to scramble ashore on one of the islands and obtain some specimens of rock. This appears to have been Young Island, one of the group of five now known as the Balleny Islands. The individual islands were named by Balleny after the partners with Enderby in the venture.

The high 12,000 ft. peak is on Young Island, and is known as Freeman Peak after the captain of the *Sabrina*. All five islands are volcanic with at least one active volcano among them, and Balleny's people saw smoke coming from Buckle Island. This has been verified by the ship *Southern Cross* in 1899.

Proceeding to the westward in about lat. 64°S. for several days they then had clear weather and no ice in sight, so again stood to the southward. The

fair weather did not last long and they soon encountered more gales with snow and sleet and a good deal of ice.

On the 2nd March, 1839, in lat. 64° 58′S., long. 121° 08′E., and in poor visibility, the water suddenly became smooth, so sail was shortened and the ships were hove-to. Land was later sighted to the southward.

The next day they were surrounded by large bergs with fast ice to the southward and every appearance of land at the back of it. The noon position was lat. 65° 10′S., long. 117° 04′E. This appearance of land is shown on the present-day South Polar Chart (1942 edition) as Sabrina Land, named after the little cutter.

Continuing to the north-westward the ships crossed on the 14th March the tracks made by Captain Cook in 1773, and on the 18th they crossed Captain Bellinghausen's track in lat. 58°S., long. 95° 15′E. They also crossed the track made by Biscoe in 1831.

A few days later they encountered a very severe gale in which Balleny's ship was damaged and was nearly lost. Freeman's little cutter *Sabrina* was never heard of again.

The *Eliza Scott* arrived back in London river on the 17th September, 1839, in time to give information of the discovery of the Balleny Islands to Captain James Ross, R.N., then about to sail on his Antarctic expedition with H.M. ships *Erebus* and *Terror*.

Balleny's voyage had filled in a gap on the circumpolar chart of about 80° of longitude south of the 60th parallel, which had not previously been sailed over by any navigator. His discoveries added a fact of considerable importance to geography: the existence of land within the Antarctic circle south of New Zealand, indicating, together with the other discoveries made by Enderby's ships, the probable existence of a great Antarctic continent.

Then followed, in 1839 to 1842, the great discoveries by Captain James Clarke Ross, R.N., in the King's ships *Erebus* and *Terror*.

An American sealer, Captain Wm. G. Smiley, did a certain amount of exploration in the islands and harbours in the Palmer Archipelago in the year 1842. He also visited Deception Island (lat. 62° 56′S., long. 60° 33′W.), where he found a self-registering thermometer left there in 1829 by Captain Foster, R.N., of H.M.S. *Chanticleer*. Smiley, like many of these early sealers and whalers, unfortunately left very few and imperfect records.

In 1853 Captain John J. Heard, in the American merchant ship *Oriental*, discovered the island which bears his name. It is in lat. 53° 10′S., long. 73° 35′E. Its peak is about 7,000 ft. and in 1910 it was reported to be an active volcano. There is, however, evidence on an old chart in the Admiralty that this island had been sighted in 1833 by Captain Kemp in the *Magnet*, on his passage south from Kerguelen Island to his discovery of Kemp's Land.

MacDonald Island (53° 03′S., 72° 32′E.) was discovered in 1854 by Captain MacDonald of the British ship *Samarang*.

An American whaler, Captain E. D. Rogers, of the *Corinthian*, was the first to land on Heard Island in about the year 1856.

From 1842 until 1873 little more exploration was carried out in the far south. In the latter year Captain Edvad Dallman, on a sealing voyage in the German ship *Grönland*, visited the west coast of Graham Land, and explored and named Bismarck Strait and Booth, Krogmann and Petermann Islands.

The last-named lies in lat. 65° 10′S. and long. 64° 10′W. He also visited the South Shetlands and the South Orkneys (or Powell Islands).

The southern sealing was revived somewhat by British and American vessels between 1872 and 1888, but no records of any of their discoveries or surveys appear to be in existence.

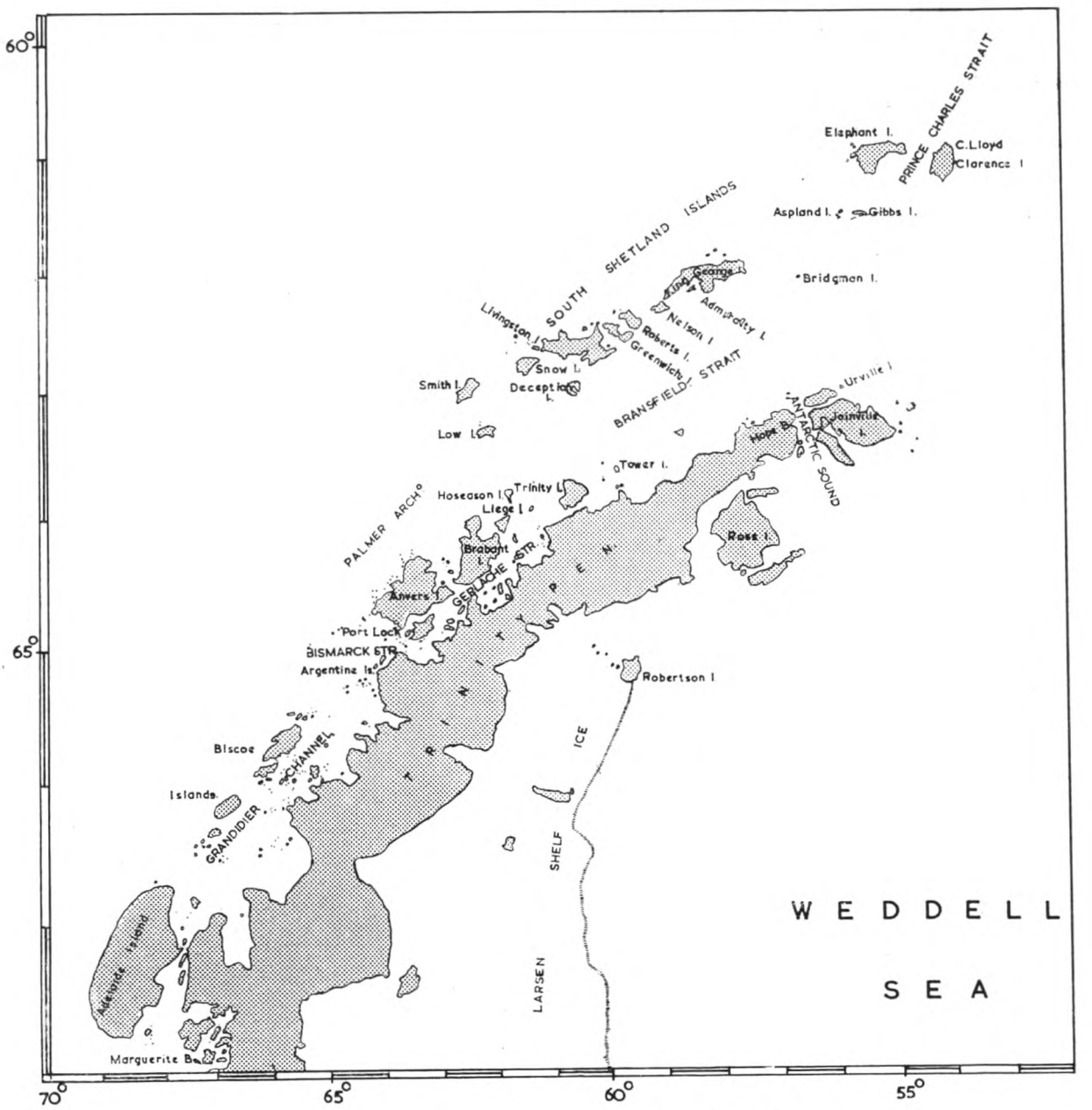


Chart of sea areas around Graham Land

The Norwegian whaling and sealing vessel *Antarctic*, Captain L. Kristensen, sailed from Tönsberg in September, 1893, for the Antarctic. Mr. J. H. Bull, the organiser of the venture, sailed in the ship. His object was to explore the possibilities of whaling and sealing in the Ross Sea and in that sector of the Antarctic waters. The ship was a barque rigged auxiliary steam vessel of the usual whaler type of those days. She was equipped with harpoon guns and all concerned had high hopes of a commercially successful voyage.

After calling at Madeira the *Antarctic* arrived at Tristan da Cunha on the 24th November. An old retired American whaleman, Captain Higgin, was

living there at the time and he gave the expedition some advice on the southern whaling.

Proceeding eastward they called at Marion Island and Prince Edward Island and then at the Crozets. No whales were found so the voyage was continued to Kerguelen Islands, where many seals and sea elephants were killed. At one time several hundred vessels, mainly American and British, were employed at the sealing and whaling around these islands. The *Antarctic* landed her catch of oil and skins at Melbourne, and then during the southern winter made a voyage to Campbell Island, lat. 52° 33′S., long. 169° 09′E. She had little luck however, only one right-whale was killed, and after visiting the coast of New Zealand she returned to Melbourne at the end of August, 1894.

So far the whaling had been a failure and the sealing not very profitable. The main objective of the voyage, however, was yet to come. It was the penetration of the Ross Sea to capture a full cargo of right-whale oil from the large numbers of these creatures reported to be in the area by Captain Ross, R.N., in 1841.

After refitting, the *Antarctic* sailed for the south in October, intending to call at the Royal Company Islands on the way, but was prevented from making them by a westerly gale. Macquarie Island was seen but bad weather prevented a landing. At Campbell Island a few seals were taken.

A search was made for Emerald Island, but without success. Other attempts to verify the existence of this island have been made with like results. It still remains on the chart marked (E.D.).

The *Antarctic* encountered her first ice in lat. 56° 57′S. On the 6th November, although in lat. 58°S., a whole degree south of its reported position, what was thought must be Emerald Island was sighted. It turned out to be an enormous iceberg fifty miles long! The ship's propeller then working loose she was compelled to retreat to the north to Port Chalmers in New Zealand for dry-docking. On the way south again a call was made at Stewart Island. Entering the Ross Sea much pack-ice was met. The Balleny Islands were sighted on the 22nd December, when in lat. 66° 03′S., long. 167° 37′E. Forcing her way through the pack the ship was almost beset, but eventually got through to open water. Mount Sabine and Cape Adare were sighted and on 19th January they were at the Possession Islands in lat. 71° 56′S. Names were given to some of the islands. As, by the 22nd January, no right-whales had been seen, the ship returned to the northward. A landing was made near Cape Adare and the members of the expedition considered themselves the first to land on the Antarctic continent. It seems, however, that this honour belongs to Smith and Bransfield in 1820.

The whaling venture had been a failure. No new discoveries were made but extra knowledge was obtained of the western side of the Ross Sea, with notes on the appearance of the land. Considerable knowledge of the weather and ice conditions was also gained.

The suggestions made by Mr. Bull in his book *The Cruise of the Antarctic* helped to point the way to the great southern whaling industry now being carried on.

In the 1892–93 season four Dundee auxiliary steam whalers, the *Balaena*, Captain A. Fairweather, *Active*, Captain T. Robertson, *Diana*, Captain

R. Davidson, and *Polar Star*, Captain J. Davidson, were in the South Shetland and Weddell Sea area. Meteorological logbooks were kept by these ships ; that of the *Balaena* being kept by the ship's surgeon, Dr. William S. Bruce, who later led an expedition to the far south in the whaler *Morning* in 1902–04 and discovered Coates Land. The *Balaena's* meteorological log is still in the Marine Branch of the Meteorological Office, together with the logs of the other three ships. The log contains many remarks of interest and was evidently most carefully written up by a keen observer. As well as the weather record there are notes on the ice, bearings and appearance of land and on the animal and bird life of the area. The entry " no beasts " occurs on many days and appears to refer to seals.

The ships worked in the vicinity of Joinville Land, the Danger Islands and Poulet Islands. Graham Land was sighted on several occasions. The *Active*, Captain T. Robertson, discovered the channel separating Joinville Island from Dundee Island and named it Active Sound. In January, 1893, new mountainous land was sighted by the *Balaena*. It lay to the SW of Erebus and Terror Gulf. This land was more fully described by Captain Larsen of the Norwegian sealer *Jason*, who traced it in about 60°W. from lat. 65° to 68°S. No other geographical discoveries of importance were made by the British vessels.

The *Balaena* was barque-rigged, 141 ft. long, 31 ft. beam, of 416 tons gross, 248 tons net. Very severe weather was encountered at times, as is shown by the following extracts from her meteorological log for 29th and 30th January, 1893 (mid-summer), when to the eastward of the Danger Islands in about lat. 63°S. : " Wind SE, force 10, to W × S, 10. Temperature 28·4°F. Pronounced by all to be the hardest gale since we made the ice. Still under lee of bergs SW. A dirty dull night. The darkest we have had. . . . A stream of ice to windward keeps surf down. No beasts. Wind at noon SSW, 10, midnight E × S, 9. Temperature 28°F. Alongside close pack-ice to starboard. Lost position by berg. Pack moving at great rate, surge breaking over it from the weather side. Could scarcely have borne close-reefed topsails in open sea with well-trimmed ship. At times force of wind must have exceeded 10. Steamed full speed from 10 p.m. yesterday to 8 a.m. today and made one mile headway. Dark dirty night."

The sealing venture was not a great success, and there was disappointment that no right-whales were sighted.

The four British ships were often in company with the Norwegian ship *Jason*, commanded by Captain Carl Anton Larsen. The *Jason* carried out sealing off the eastern coast of Graham Land or West Antarctica and pushed farther to the southward than did the Dundee whalers.

The next season, 1893–94, Larsen was again south in the *Jason* on a whaling and sealing venture. He again visited Erebus and Terror Gulf and landed at Cape Seymour (Seymour Island) in about lat. 64° 20′S., long. 56° 40′W. Here he made remarkable discoveries of fossil trees and other vegetation, the first to be found in Antarctica.

Larsen coasted along what is now known as the Larsen Ice Barrier to the southward, reaching his farthest south, lat. 68° 10′, in December, 1893.

The coast of Graham Land visible to the westward and SW of the ice barrier he named " King Oscar II Land ", and that S of about 67° was given the name of " Foyn's Land ". When returning north he landed on and

named Robertson Island, on which was Mount Christensen, an active volcano then in full eruption, but now extinct.

A bay on the mainland sighted by him is known as Larsen Bay. Larsen Channel, which separates D'Urville Island from Joinville Island, was discovered by him in 1902 when in command of the whaler *Antarctic* of the Nordenskjold expedition.

Captain Larsen, although engaged in the business of whaling and sealing which, of course, was bound to occupy most of his time, was a true explorer and made good use of his opportunities for discovery.

Other Norwegian vessels were in the far south that year, 1893. Captain Evensen in the sealer *Hertha*, in company with the *Castor*, Captain M. Pedersen, cruised to the southward down the west coasts of Graham Land and past the Palmer Archipelago, the Biscoe Islands, Adelaide Island, which was fairly free of ice that year, and sighted Alexander I Land, reaching lat. 69° 10'S., long. 76° 12'W. They, like Larsen, carried out a considerable amount of exploration, and their voyages no doubt led to the great expansion of Norwegian whaling in the far south.

The present century has seen considerable extension of our knowledge of the Antarctic continent. Apart from expeditions sent out by several nations solely for the purpose of exploration there have been numerous sightings of the mainland by whaling ships; a good deal of the main outline of the continent is now charted, but much detail needs yet to be discovered. The Admiralty South Polar Chart shows no land in the Bellinghausen Sea between the meridians of 76°W. and 140°W., except Peter I Island, discovered by Bellinghausen in 1821.

Much of the modern whaling, and therefore the recent discoveries have been in that part of Antarctica lying in east longitude.

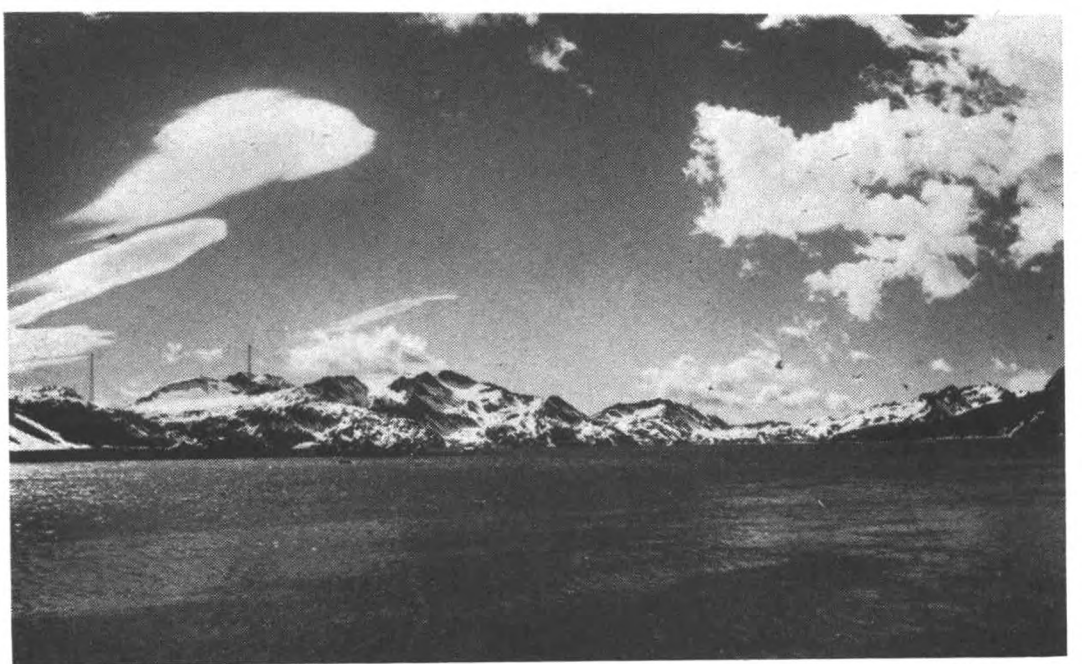
In 1905 Mr. Christensen, of Norway, sent out the first whaling factory ship, and his son has carried on the same venture. Their ships gave particular attention to exploration, and between the two great world wars much land was discovered and charted between Longitudes 17°W. and 86°E. Norwegian names have been given to the land discovered between the longitude of Coates Land (about 17°W.) and long. 45°E. This sector is claimed by Norway. Farther east in the sector known as Australian Antarctic Territory, whalers have made other geographical discoveries during their ordinary voyages.

In 1923 the Norwegian whaling factory ship *Sir James Clark Ross* with five small whalers reached the Bay of Whales in the Ross Sea and coasted along the Great Ice Barrier to Discovery Inlet. *Star I*, one of her small whalecatchers, visited Franklin Island, McMurdo Sound and Cape Royds, and the coasts of Victoria Land north to Cape Adare.

Whalers owned by Messrs. Salvesens, of Leith, were on the west coast of Graham Land in 1924. Gunners S. Beckmann and G. Mathison in two whalecatchers steamed south along what was then known as " Falliéres Coast " as far as Marguerite Bay in about lat. 68°S. They reported that the coast turned sharply in an easterly direction. It was thought that possibly there was a channel through to the Weddell Sea, but this has since proved to be non-existent.

The whalers *Norvegia* and *Odd I* charted a good deal of coast during the years 1926–31 in the area claimed by Norway and elsewhere. Captain

Anderssen in the *Odd I* left South Georgia in January, 1927, and steamed to the west side of Graham Land and to the southward in search of whales. He discovered two uncharted islands in Belgica Strait and passed through Schollaert Channel. On the 17th January he reached Peter I Island and steamed round it but was unable to land. Since it was discovered by Bellinghausen in 1821 the island had been sighted only once, by Charcot in 1910. It lies in lat. 68° 49′S., long. 90° 32′W.



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Grytviken Harbour, South Georgia ; looking eastward
1200 G.M.T., 6th December, 1930

Peter I Island was visited by the *Norvegia* in 1927 and again in 1929, when a landing was made on the western side. In 1930–31 the *Norvegia* circumnavigated Antarctica. The Norwegian whaling factory ship *Ole Wegger*, with the small whalers *Firern* and *Bouvet* and the supply ship *Thorshavn*, did a lot of exploration during the years 1930–37. An aircraft was carried and much hitherto unknown land was photographed and charted.

Ingrid Christensen Land (long. about 70°E. to 80°E.) was discovered by Captain K. Mikkelsen in the *Thorshavn* in 1935. The same ship's aircraft in 1937 discovered unknown land in lat. 69° 30′S. between longitudes 34° and 40°E. This has been named Prince Harold Land.

New land was also sighted in long. 8° 28′E. by the whaling factory ship *Thorshammer*, Captain G. Bull.

It is not pretended that these notes give a complete account of the exploration and discoveries carried out by merchant seamen in the far south. The cases mentioned above are available in various publications ; research into the matter would probably reveal other long-forgotten voyages of the sort.

The writer has no doubt that more information of the sort is lying stowed away in old logbooks, but has never been published because, at the time of the discoveries, it was thought wiser to keep the knowledge secret for business reasons. This is readily understood when we remember that those engaged in the seal or whale " fisheries " were hunters in keen competition with many

others, and that their livelihood depended on their making a good " voyage ". Strangers were not welcome on their new-found rich hunting grounds.

Each southern whaling season since the war there have been a number of British and foreign whaling factory ships in the far south, with their attendant whale catchers and tankers. Several of these vessels carry out meteorological observing as Selected Ships and transmit by radio routine weather reports which are of great value to the Meteorological Services in the southern continents.

For the above notes, acknowledgment is made to the following publications :—

The Antarctic Pilot, Second Edition, 1948.
The Antarctic Manual. R. Geo. Soc.
Voyage towards the South Pole, 1822–1824. By James Weddell.
The Siege of the South Pole. By H. R. Mill.
Cruise of the Antarctic. By H. J. Bull.
Antarctica. By Edwin Swift Balch (U.S.A.).
From Edinburgh to the Antarctic. By W. G. Burn Murdock.
Polar Record, Vol. IV, 1946. R. Geo. Soc.
Voyages round the world. By Edmond Fanning (U.S.A.).
A Narrative of four voyages to the South Seas. By Benjamin Morrell (U.S.A.).
First on the Antarctic Continent. By C. E. Borchgrevink.
To the South Polar Regions. By Louis Bernacchi.
Antarctica. By Otto Nordenskjold.

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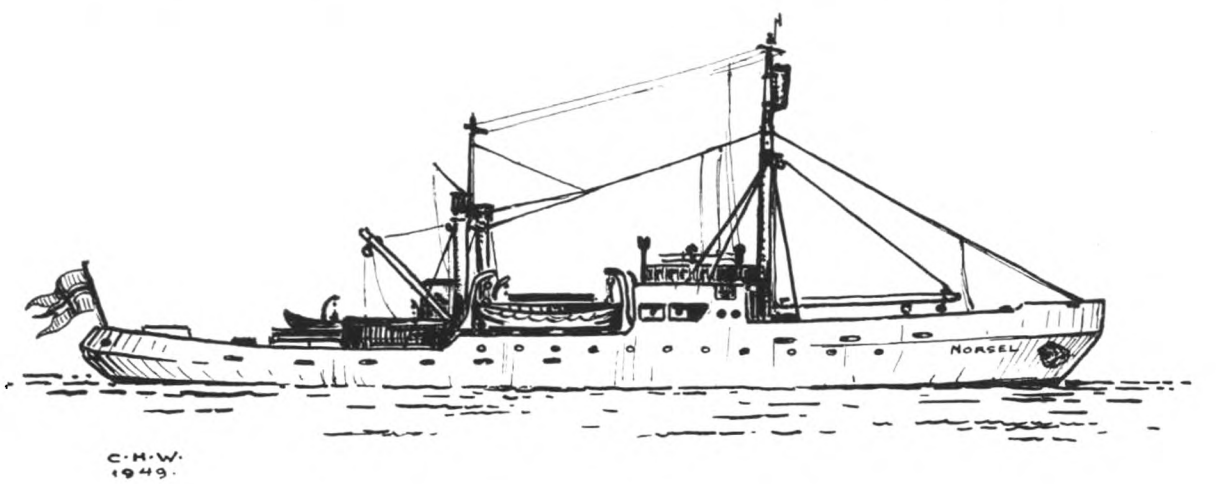
Captain Duggan showing his presentation barograph to Captain Holland aboard the *Wellington* on 18th January, 1950
(See Editorial, page 58)

JOINT EXPEDITION TO THE ANTARCTIC

BY CDR. C. F. N. FRANKCOM, R.N.R.

On 23rd November, 1949, the Norwegian motor vessel *Norsel*, a sealer of 592 tons gross and 165 ft. in length, left London Dock for the Antarctic. She had aboard fourteen members of a joint Norwegian/British/Swedish scientific expedition who intend spending two years in Queen Maud Land, which lies between longitudes 20°W. and 45°E., south of lat. 70°S. The *Norsel* is to land the party there, together with the necessary huts, provisions and equipment, and expects to take them off again early in 1952.



The objects of this expedition are entirely scientific and its international character is quite unique. The Norwegian Government is paying the greater part of the cost, although considerable contributions are being paid by Sweden and the United Kingdom. The Royal Geographical Society is appropriately the British headquarters of the expedition. The expedition is primarily under the auspices of the Norwegian Polar Institute, a member of which, Captain John Giaever, is the official leader of the expedition. The Norwegian Polar Institute is responsible for transporting the expedition to the Antarctic.

The scientific work is equally divided between the three countries—Norway being responsible for meteorology and survey work, Sweden for glaciology and Great Britain for geology. In addition, magnetic observations will be made and seismic investigations of the ice cap will be carried out. So little is known about this silent white continent that there is undoubtedly an enormous field for scientific investigation there.

Two Auster aircraft, provided by the British Government, with R.A.F. crews, are travelling in the ship for air reconnaissance purposes, both for assisting in finding a way for the ship through the field-ice and also for aerial survey over Queen Maud Land itself. Photography will undoubtedly play quite an important part in the work of the expedition.

The meteorological work of this expedition is very important, for owing to the massive nature of the Antarctic continent and its extreme cold and the violent weather experienced in the vicinity, there seems little doubt that its meteorology does in some way or another affect that of many other parts of the world. Its study at first hand is therefore of great importance to world meteorology. The meteorological programme will include, in addition to

regular surface observations, radio sonde and radio wind observations of the upper atmosphere. The expedition is provided with radio apparatus and will thereby be able to transmit and receive observations for synoptic purposes.

For its meteorological work the expedition is anxious to receive reports from any ships which are in the Southern Ocean. This will particularly apply to whaling vessels and special arrangements have been made to secure reports from them, but observations from all ships will certainly be very welcome. The expedition will undoubtedly intercept " collective " messages from southern hemisphere centres which will contain whatever ship messages are available. Any ships in the Southern Ocean which can send weather messages direct to the expedition (call sign LMQ or LH2F, frequencies 500–800 metres, or 6, 8, 12, 16 and 22kc/s.) will render them very practical help.

Although much of the scientific work will be carried out at the expedition base, " weasels " (mechanised snow vessels) as well as sledges pulled by dog teams will be used by parties to explore the interior of the territory. Such journeys will be particularly important to the geologists and glaciologists.

For an expedition of this type an enormous amount of equipment has to be carried, and the landing of it on the inhospitable Antarctic coast will present many problems. Thorough air reconnaissance will be necessary, for the whole coast is covered by glacier ice which is full of dangerous crevasses, but air photographs taken before the war show that the glacier ice slopes gently down to sea level in some places.

The *Norsel* is a newly-built steel motor vessel specially strengthened against ice. A pen-and-ink drawing of the vessel is shown on page 103. Her navigational equipment includes a Sperry minor gyro compass (trawler type). Her master hopes to be able to get through the ice and approach the Antarctic continent close enough to land the expedition some time in February, 1950, but much will depend upon the state of the ice.

After the *Norsel* has landed the expedition her master expects to take her up to the vicinity of the Labrador coast, where she will carry on with her normal job of sealing before she returns to Norway.

SOUTHERN ICE REPORTS

During the year 1949

April, May and June. No reports received.

Reports of ice for April, May and June previous to 1949, will be found in *The Marine Observer*, Vol. XIX, No. 144, page 120.

WEATHER IN AUSTRALIAN WATERS

BY J. V. MAHER, B.SC., AND P. RILEY

(of the Australian Meteorological Service)

General

Wind, waves, icebergs and fog are the hazards from which a master must safeguard his ship. Viewing the position from " down under ", one may say that the way of a ship's captain in this regard is smoother than in the notoriously stormy seas between Europe and America and in other world oceans. In the Australian waters there are few fogs, icebergs are unknown and the sea and air—at their coldest around Tasmania in winter—are mild compared with those of the famed Atlantic. But lest the weather be taken too lightly, it is well to warn those who sail in these waters that the full fury of the sea may be experienced at any point around the vast Australian coastline. The winter depressions and " roaring forties " of the Great Australian Bight provide the hazards of the southern coast ; on the eastern coast there are the tropical cyclones which are as intense as any hurricane of the West Indies, whilst on the western coast the dreaded willy-willies are to be equally feared. The north coast is visited only very occasionally by erratic travelling tropical cyclones, the principal dangers being due to the familiar tropical thunder squalls with torrential rain and bad visibility which occur mainly in the summer months.

The dominating trend in Australian meteorology is the seasonal swing of the sub-tropical belt of high pressure. The belt follows the sun and thus reaches its northernmost position in June and its southernmost position in December. If it is remembered that with this latitudinal zone of travelling anticyclones there moves also a zone of easterly winds on the northern (Equatorial) side and a zone of westerly winds on the southern (Polar) side, a great deal of the seasonal trend of Australian weather will be understood.

Winter Weather

The easterly winds, of course, are none other than the familiar south-east trades and these are noteworthy for their steadiness and moderate force. A line drawn from east to west across the centre of the Australian continent and continued both east and west would roughly delineate the southern limit of the trades in mid-winter. This means onshore trades for the whole of the eastern coastline of Queensland. Along the northern Australian coastline the trades are mainly offshore, though they tend east-south-east between the mainland and New Guinea.

The whole of the northern section of the continent is experiencing its dry season at this time of the year (May to October) and dry, dusty, hazy trades with only fair visibility sweep over Darwin and other coast towns, thence across the Timor to the Netherlands East Indies and finally swing to south-west as they cross the Equator as an ocean-moistened monsoon stream, largely cleared of haze by showers and turbulent mixing. In all cases these winds are remarkably steady and consistent in direction, although their speed, and to some extent their direction, are affected at intervals by the

passage of anticyclones over the Australian continent. The advent of a particularly intense anticyclone, perhaps travelling a little to the northward of the usual latitudes, will cause the trades to reach a speed of Beaufort force 5 and 6, and the usually moderate seas will become rather rough to rough from the Coral Sea through to the Timor and Arafura and the seas around the Netherlands East Indies, Borneo and Sumatra. Over the Indian Ocean, near the north-west Australian coastline, the trades freshen similarly, but, until some distance from shore, the swell has only a small fetch and in coastal waters comparatively smooth conditions can be expected since the trades are offshore winds.

Continuing the discussion of the winter season, that is, roughly from May to October, and now considering conditions south of the anticyclone belt, the important element is, of course, the belt of westerly winds which make up the circulation on the southern side of a " high " in the southern hemisphere. These " westerlies " are in reality mainly north-westerly to south-westerly winds, but, unlike the trade-wind belt, an infinite variety of wind and pressure systems is possible.

Since the anticyclone belt is in its northernmost position, the southern half of the Australian continent in winter is subject to the westerly winds. The coast from Cape Leeuwin northward to Geraldton and eastward to Gabo Island is exposed to these winds and rough seas are frequent, whilst the westerly swell from the long fetch of the " roaring forties " is ever present.

However, the characteristics of the belt of anticyclones need some explanation, mainly to account for the occurrence of northerly and southerly winds and their variations round to westerly which occur so frequently. Actually the belt is composed of a number of anticyclonic cells which often follow one another across the Australian continent in a regular procession. These are separated mainly by inverted V-shaped depressions in the trough of which is a cold front. The normal time interval between the successive arrivals of these anticyclones at a particular place is about six days, but great variations may occur. The fronts in winter are almost invariably followed by a series of secondary fronts which bring low cloud and rain squalls. The main fronts have great variety but always bring low cloud and showers and quite often squalls of to forty to sixty miles per hour occur. Behind, that is, on the western side of the front, is the cold air moving eastward and northward from the Southern Ocean and bringing showers and, if the air is colder than usual (about 45° to 50°F.), hail. As the centre of the anticyclone approaches the showers cease, dull weather with widespread sheets of strato-cumulus often occurs and remains until the rear of the " high " brings northerly winds (usually north-westerly) and a new front approaches. The northerlies usually bring fine milder weather and moderate seas, in contrast with the rough conditions experienced following the frontal passage. Farther to the south, however, and at times over the Bight and eastern Australian waters, there is little respite from winds swinging between west-south-west and west-north-west and lasting even for periods of from two weeks to a month. The Tasman Sea between Australia and New Zealand experiences similar conditions, but close to the New South Wales coast, on the Sydney to Melbourne run, there are more moderate conditions in the lee of the continent.

Summer Weather

In summer, that is, from about November to April, the picture is changed by merely shifting the belt of anticyclones to a latitude corresponding to the Australian Bight. The trades move down over the southern two-thirds of the continent and the Equatorial low-pressure belt lies across northern Australia, with the north-west monsoon bringing the warm, humid wet season to the northern coastal areas. This is perhaps an over-generalised picture, but from the point of view of the mariner it is substantially correct. There is a gradual movement of the Equatorial low-pressure trough and it is by no means always oriented east-west. The salient point is that by January the waters between Sumatra and the Solomons are comparatively quiet under the influence of the warm, humid west to north-west winds. Thunder squalls with intense rainstorms and temporarily rough seas are the main phenomena which may be dangerous to shipping.

To the south of the Equatorial trough, which may be ill-defined and constantly shifting, are the trades, extending southward roughly to the latitude of Tasmania. Farther south again are the westerlies. As in winter, there are many breaks through from the westerly belt in the form of south-westerlies or strong southerlies between anticyclonic cells, and the same but less intense weather cycles occur as described for winter travelling systems.

*Tropical Cyclones

The trade belt brings its usual weather, but the main feature of the summer season is the occurrence of the intense closed cyclonic vortices which are called tropical cyclones on the eastern side of Australia (Coral Sea and the Pacific) and willy-willies on the western side (Indian Ocean). The Coral Sea and the adjacent Australian coast comprise an area over which tropical cyclones rage in all their fury, and with a view to giving to the mainland and to shipping earlier warning of the movement of these cyclones, the Australian Government in 1921 established a storm-warning station at Willis Island. There is scarcely a town along the Queensland coast that has not suffered at some time as the result of a cyclonic visitation, while losses of shipping and of life at sea from the same cause have been heavy. Along all the eastern tropical Australian coast, cyclones are most frequent on that part between Cooktown and Mackay, but they are also sometimes experienced farther south.

Tropical cyclones crossing the Coral Sea and affecting Queensland most frequently originate between latitudes 8° and 15°S. and between longitudes 155° and 165°E., i.e. in the vicinity of the Louisiade Archipelago and the Solomon Islands. After having developed, they generally move slowly in a south-westerly direction. On approaching lat. 20°S. they recurve with an even slower rate of translation, after which they move more rapidly in a south-easterly direction; with the majority the course they follow is a parabolic one. The rate of movement of cyclones varies, and has reached 45 miles per hour (39 knots); the south-westerly movement towards the coast is on the average of about 17 miles per hour (15 knots). Near the coast,

*This section on tropical cyclones and willy-willies is largely taken from the publication *Weather on the Australia Station*, issued by the Australian Meteorological Service. (Restricted.)

as the cyclone recurves, its movement is only about 5 to 10 miles per hour (4 to 8 knots), but once having set off on its south-eastward course it usually travels at a rate of 20 to 30 miles per hour (17 to 26 knots) and becomes less violent, though more widespread in its effects. Fig. 1 shows the course of a typical tropical cyclone striking the central Queensland coast. The movement sometimes appears to be irregular, as if the cyclone were alternately advancing and retreating on its course towards Queensland, and an inspection of a succession of charts seems to support this view ; but it is probable that in many such cases, were a close network of observations available, the apparent irregularity would be transformed to a steady but unusually slow movement along the normal track.

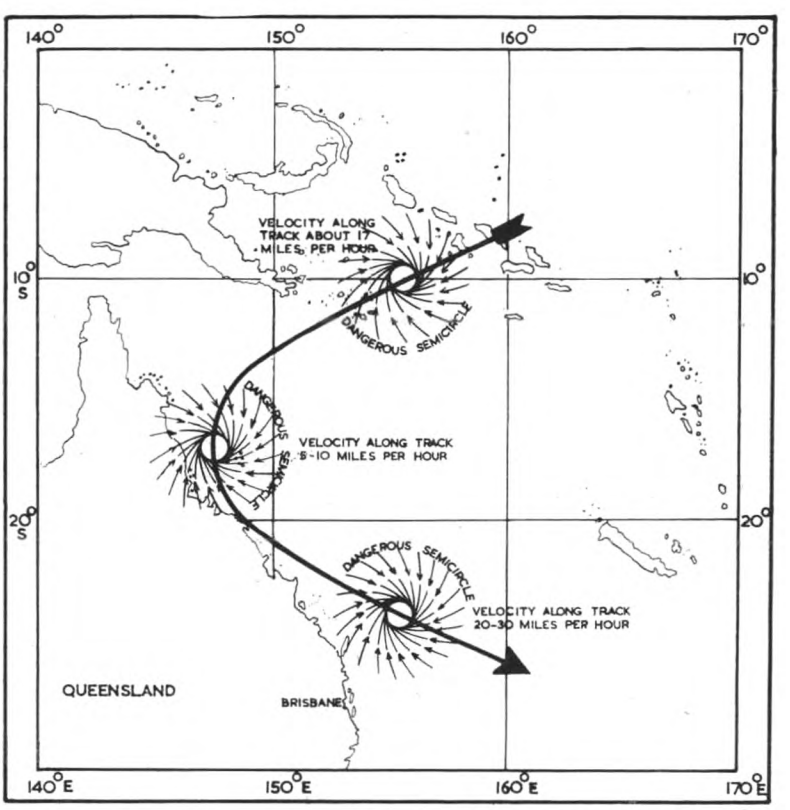


Fig. 1
Course of typical tropical cyclone

As the cyclone passes a region, winds blow with gale to hurricane force for some hours with gusts of tremendous force, and should the storm be moving slowly gales may continue for a day or two The majority of cylcones, of course, follow approximately the path described in Fig. 1, but some, recurving in the normal manner, skirt the coast as far south as Brisbane before taking a south-east direction to the north Tasman Sea. Again others recurve to south and south-east at some distance east of the coast before the Barrier Reef is reached, while some cross the coast mainly north of Cooktown, and either move inland along a track that occasionally extends to the north-west coast of Western Australia, or recurve in the interior to pass out to sea again across the coast of southern Queensland. The majority of cyclones after passing inland diminish in intensity ; on the other hand, those that pass from land to sea intensify. Occasionally a cyclone develops from a depression inland and passes out to sea over the Queensland coast. This usually occurs

in the winter months and south of the tropic of Capricorn, but on rare occasions an unseasonable winter cyclone results from such a storm taking an abnormally far north course.

In order to discuss the incidence of tropical cyclones affecting the Queensland coast, they may be conveniently divided into the three following classes : (*a*) those that cross the Coral Sea and strike the Queensland coast somewhere north of the tropic of Capricorn, whether they recurve or pass inland, and in addition those which recurve before reaching the coast, but in latitudes north of the tropic ; (*b*) those which strike the coast south of the tropic or recurve to the east of that part of the coast ; the main storm effects of this class are felt farther south on the New South Wales coast or in the Tasman Sea ; (*c*) cyclones passing to sea from inland parts of Queensland. (See table below.) It has been possible to chart, according to the types classified above, the tracks of 190 cyclones experienced during the seventy-three-year period 1867–1939 inclusive. Their frequency is thus between two and three annually. In addition there are on the average each year about two or three storms of less severity.

In the table below the quarterly distribution of cyclones according to class is given.

QUARTERLY DISTRIBUTION OF TROPICAL CYCLONES

(1867–1939, 73 years)

Classification as indicated above	*January, February, March*	*April, May, June*	*July, August, September*	*October, November, December*
(a)	94	6	0	8
(b)	27	27	15	10
(c)	0	2	1	0
Total (a+b+c) .	121	35	16	18
Tropical disturbances of lesser intensity (1867–1924, 58 years) ..	41	29	13	18

The cyclone season extends from December to April, and of the first type of cyclone about 98 per cent have occurred within this period ; the only other months in which hurricanes of this kind have been recorded are May and October. Cyclones of the second type are of far less importance in these regions ; they are fairly evenly distributed through the months January to July inclusive, and are less frequent from September to December, while no cyclone has been recorded in the month of August. Occasionally a season passes without a severe cyclone being recorded ; in some seasons they number up to four. The early months of 1940 provided six cyclones, two of which caused considerable damage in the Innisfail-Mackay section.

It is only a very rare cyclone that crosses the Queensland coast north of the tropic of Capricorn on an eastward course. Normally their track is too far south to affect these areas. Nevertheless, with the few of this type that have been recorded (in June and July) the weather was quite as severe as with the more familiar type of cyclone from the north-east. It is possibly that some cyclones—or at least their centres—may develop, cross the Coral Sea and die away to the south-east without being recorded in any phase of

their existence, and quite severe storms may escape detection. In the great majority of cases, however, the storm-field of the cyclone in which destructive winds and seas are experienced has a diameter of between 100 and 200 miles, but the area of deep dense cloud, impaired visibility and heavy rain is much greater ; thus it is in general by these latter effects that the tropical cyclone, particularly at sea, is recognised.

Over tropical seas the diurnal variation of atmospheric pressure is very pronounced and any departure from its regularity should be regarded with suspicion. Normally maxima occur about 1000 and 2200 hours with evenly spaced minima at about 0400 and 1600 hours local time, while the amplitude is approximately one-tenth of an inch (about 3 mb.). It is only when a cyclonic centre passes close by that the diurnal variation on a station's barograph is completely masked. This usually occurs within 100 miles of the centre.

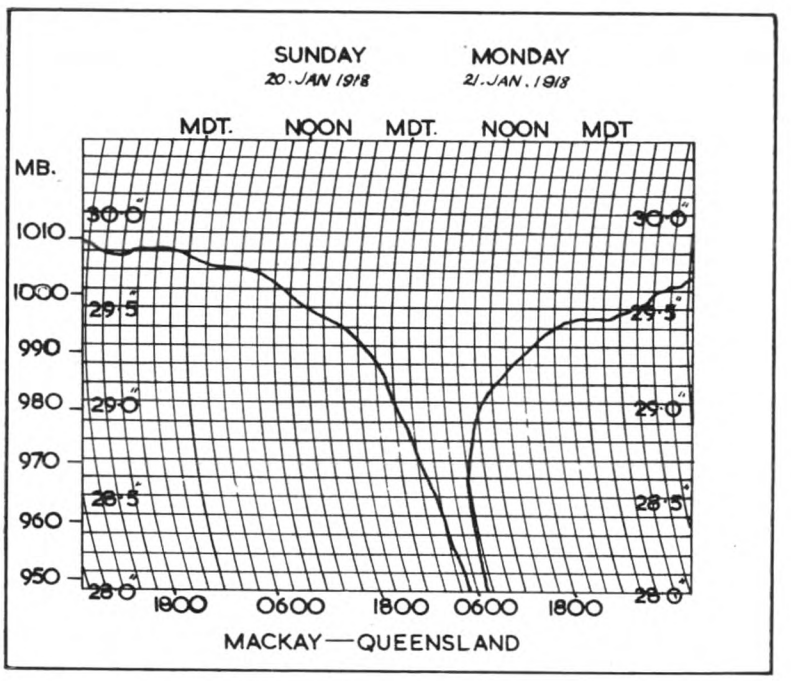


Fig. 2
Barograph trace at Mackay (Queensland) 20–21 Jan., 1918

Observations along the Queensland coast at the fixed hours 0900 and 1500 hours local time and, in addition, at 2100 hours local time at some stations, have only on very few occasions shown pressure readings below 29 in. On the occasion of an unusually violent cyclone, a barograph trace was obtained in which it is clear that the cyclonic centre must have passed almost over the observation site. This occurred at Mackay in January, 1918. The barogram is reproduced in Fig. 2 ; it will be seen that pressure fell below the range of the chart but an observation made independently when pressure was lowest gave a value of approximately 27·55 in. (933 mb.). Even so, readings that were made at 0900 hours local time on 21st January, 1918, at Bowen (29·044 in.) Mackay and St. Lawrence (29·232 in.) were the lowest on record. The intensity and width of this storm were in marked contrast to corresponding features of the cyclone in the same region in December, 1916. Thus it will be seen that cyclones in this region may reach the intensity of similar storms in other parts of the tropics. It is estimated that at Mackay, where a tidal

wave also occurred, this storm caused damage to the extent of about £1,000,000 and thirty lives were lost. Rains were exceedingly heavy over a wide area; at Mackay 627 mm. (24·7 in.) fell on 21st January and 1411 mm. (55·6 in.) fell in a three-day period. Flooding that followed was severe. At this station the lowest barometric pressure on record is 28·792 in. or 975 mb. (in a cyclone of February, 1940), and in the course of twenty years' records thirteen storms have caused pressure to fall below 29·5 in.; four times in the month of January, five in February, one each in March and April and twice in December.

Willy-willies

The frequency and the intensity of willy-willies on the north-west coast of Australia are comparable with the tropical cyclones on the Queensland coast in corresponding latitudes. From time to time an immense amount of damage is caused in towns and harbours and losses of shipping and of life occur, particularly among the pearling fleets. An examination of 109 cyclones which occurred over a period of seventy-one years, 1872–1942, for which the records are fairly complete, shows that they average between one and two annually. Of these, January had 32, March 28, February 24, December 13, April 7, November 2 and July, September and October 1 each. Some years have had three willy-willies and one year (1917) as many as five, while on four occasions, two years in succession have had none of note.

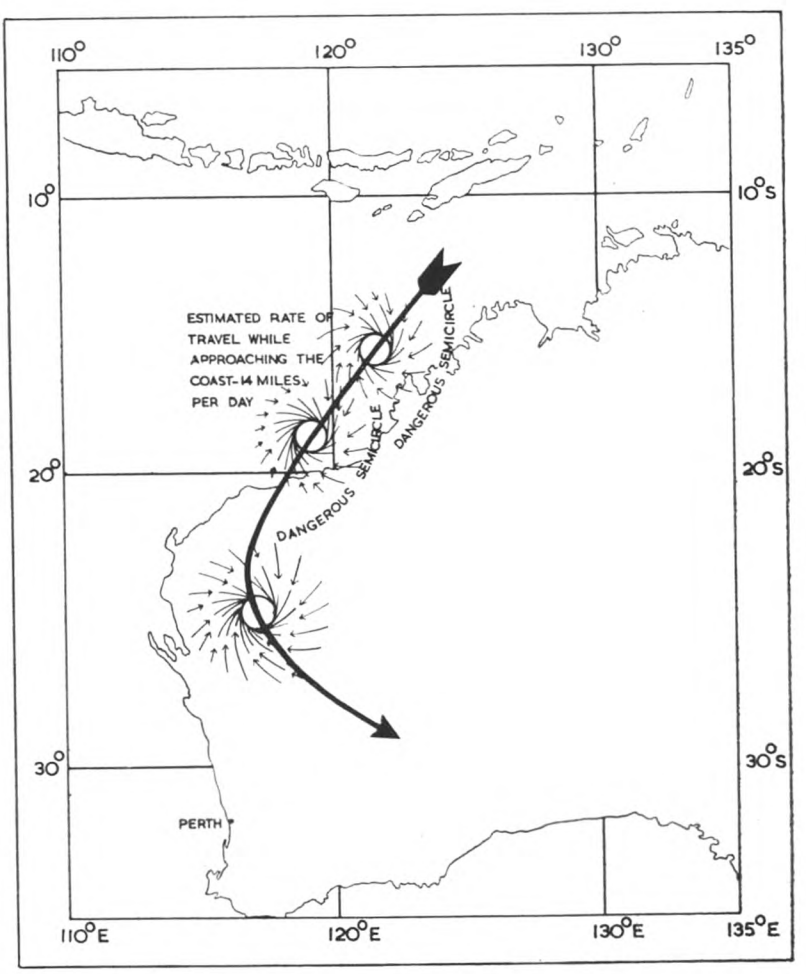


Fig. 3
Course of a typical Willy-willy

The willy-willy has its origin in the Timor Sea or thereabouts, and after pursuing a course to the south-west with a speed varying between 5 and 15 miles per hour, it recurves as it approaches that part of the coast which runs almost west and east, first moving to the south and later to the south-east over the interior of Western Australia (see Fig. 3). The coast is crossed most frequently between latitudes 20° and 22°S., though no part of the tropical coast is free from a visitation of one of these cyclones. There is a tendency, however, for willy-willies early in the season, i.e. in December, to strike the coast north of lat. 20°S., and for those of March to cross the coast between Onslow and Shark Bay farther south. Occasionally the cyclone does not cross the coast, but skirts it on a southerly course to higher latitudes. An approaching willy-willy is heralded by a falling barometer, even though the diurnal variation may not be obscured, freshening wind from the east, unusual sultriness and persistent overcast cloud and rain in a climate where normally any rain that falls occurs in the form of heavy showers; on the cyclone's rearward side clouds quickly give way to clear skies and sunshine.

The horizontal extent of the destructive storm centre of the willy-willy varies from a diameter of twenty to thirty miles to one of 100 and occasionally 150 miles. Over this area gales reach average speeds of 40 to 60 miles per hour (35 to 50 knots), and fierce gusts reach momentary speeds of 80 to 100 miles per hour (70 to 85 knots). At a particular station such conditions are not likely to persist for longer than about twelve hours, and while bad weather with cloud, rain squalls and increasing wind may be experienced for some considerable time in advance of the cyclonic centre, after the latter's passage conditions usually improve rapidly.

Observations as one of these willy-willies crossed Port Hedland showed at first south-east gales of force estimated up to 100 miles per hour (85 knots), followed by a calm period of eighty minutes (the eye of the storm), and this was succeeded by equally strong winds from the north-west for a little more than four hours. At the centre of the storm air pressure fell to 966 mb.

Damage estimated at many thousands of pounds has been wrought by willy-willies from time to time, and nearly all the towns and settlements on the coast from Broome to Onslow have suffered. Besides losses of life and shipping in the gales and mountainous seas in the open ocean and the destruction of buildings by wind, harbour works have been destroyed by onshore gales and heavy seas, while torrential rains cause inland flooding. On rare occasions a cyclone reaches this coastal area from a north-east direction, having maintained its identity over the mainland after crossing the Northern Territory coast, or after a longer trajectory from the north Coral Sea.

Cocos Island Cyclones

Near long. 95°E. there appears to be another general track favoured by tropical cyclones. It is of the usual parabolic type of the southern hemisphere with the vertex to the south of Cocos Island. Cocos itself has had occasional visits from tropical cyclones. Those that have crossed the island have been unusually severe, and the barograph trace of one in November, 1909, is reproduced in Fig. 4. It is interesting to note that in spite of the rapid fall of pressure with the approaching centre (945·5 mb.) the diurnal variation is

apparent, except in the final rapid fall, and it reappears before the normal level is recovered. This cyclone raged for about six hours, and the wind and huge waves together levelled all villages and structures to the ground and scarcely anything was left standing.

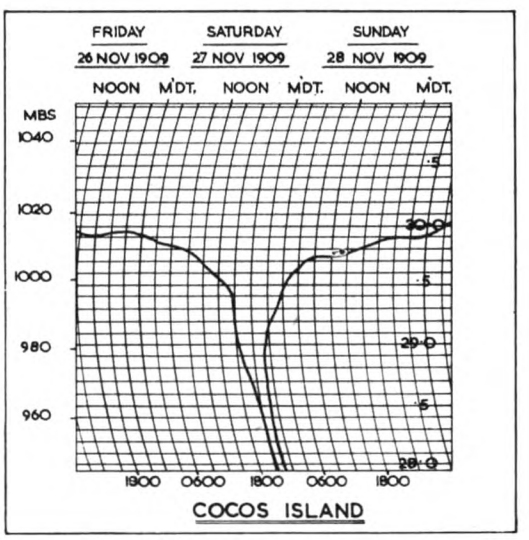


Fig. 4
Barograph trace at Cocos Island (12°12′S; 96°54′E) 26–28th Nov., 1909

From 1862 to 1909 five violent cyclones have visited the island; three of them left the island practically a waste, for which the tremendous seas were largely responsible.

Between long. 100° and the Australian coast occasional cyclones are noted, mainly in February and March.

Ocean Currents

When the ocean currents as marked on mean-flow charts for Australian waters are examined, the impossibility of adequately describing them is quickly realised. It is noticeable that in the majority of cases the mean drift is about 10 to 15 nautical miles per day, which is quite appreciable and represents for slow-moving ships a significant percentage of the day's run. The strongest current appears to be one which runs down the Queensland and New South Wales coasts roughly from Brisbane to Sydney, where a mean daily travel of up to 30 nautical miles is marked on both summer and winter charts. Of course there is a general easterly drift over the Southern Ocean, to the south of the continent and a drift which follows the trade wind streamlines across the Coral Sea, but in these and other cases the mean streamlines show that the currents reverse and flow in the opposite direction in near-coastal waters, and in many cases quite complex eddies are formed around the Australian continent.

Sea temperatures and air temperatures over the oceans are comparatively mild and mean isotherms have a mainly east-west trend, not greatly interrupted by the Australian continent. Winter temperatures are less than 5°F. colder than summer, as shown by the two charts in Figs. 5 and 6.

***Weather Service to Shipping**

With regard to weather service to shipping, the Australian Meteorological Organisation is keen to achieve the highest degree of co-ordination between ships at sea and the land-based service. In the past a great deal has been accomplished in this direction. Prior to World War II the ocean coverage had become fairly good. However, with radio silence imposed during the war and with many ships sunk and all still under Naval control, the ship reporting system more or less started from " scratch " again after the war.

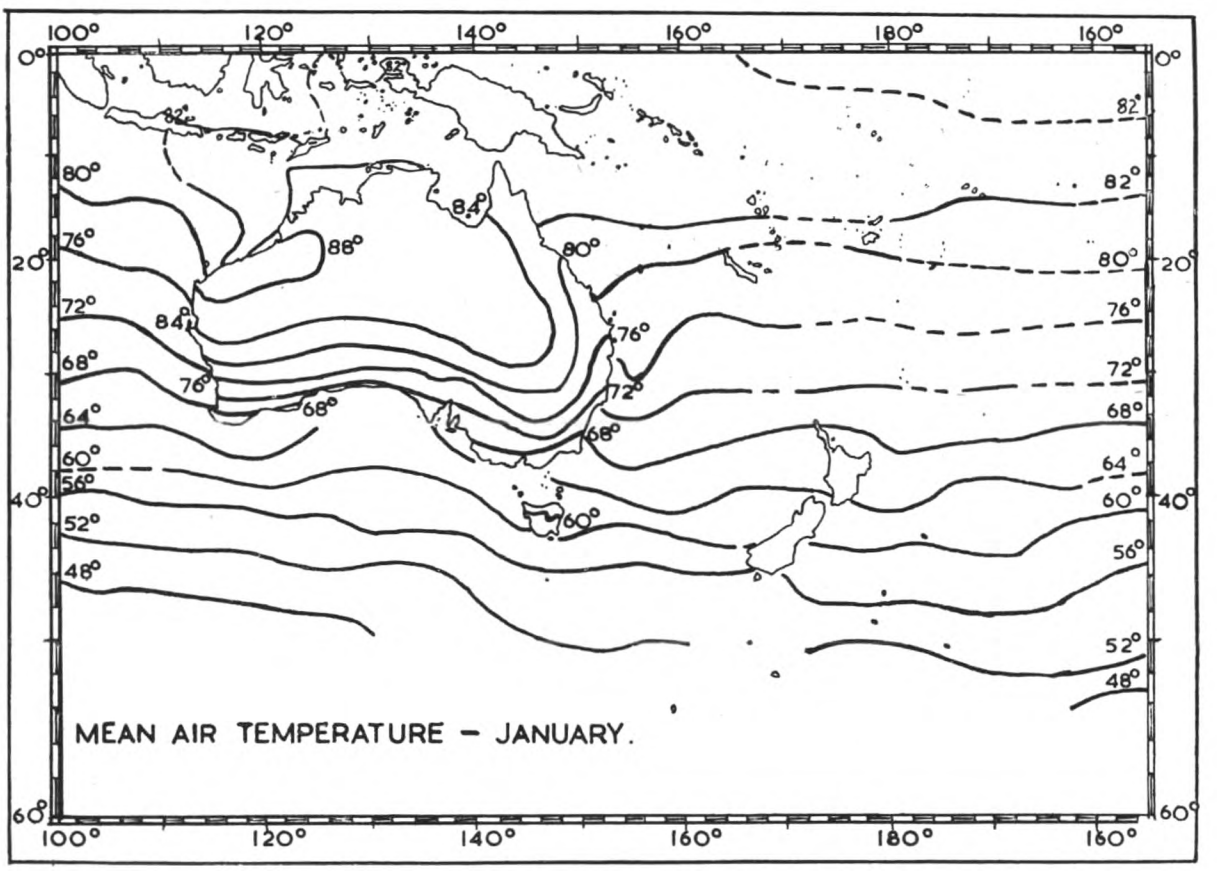


Fig. 5

With the vast ocean spaces around Australia the value of ship reports need not be stressed. The co-operation of the British, and to a lesser extent the Dutch, overseas ships has been extremely beneficial and pleasing. Personal contact has proved the best method of interesting reporting officers in the requirements of the Australian region. Visits to the Central Weather Bureau, Melbourne, and to bureaux in other Australian States are very much encouraged and are appreciated by ships' officers, particularly those sitting for F.G. certificates, as during these visits they may ask questions regarding their meteorological examinations. Selected, and even non-selected ships on southern routes have been requested to keep logs and furnish reports to enable a tie-up with Heard and Macquarie Island expeditions for Antarctic analysis. It is aimed to establish, as a minimum, a fleet of twenty Australian Selected Ships and expand this in the near future.

*The notes for this section were supplied by Mr. P. Riley (ex-R.A.N.), Meteorologist, Special Marine Officer, Weather Bureau, Melbourne. Telephone FJ 9171.

All service possible is given to British and Empire ships visiting Australian ports and every endeavour is made also to aid and advise foreign ships, repair instruments, supply codes and so on. The co-operation from ships' captains and officers of the Merchant Marine has been most gratifying and helpful, and appreciation is expressed to the officers and companies of the Voluntary Reporting Marine Service.

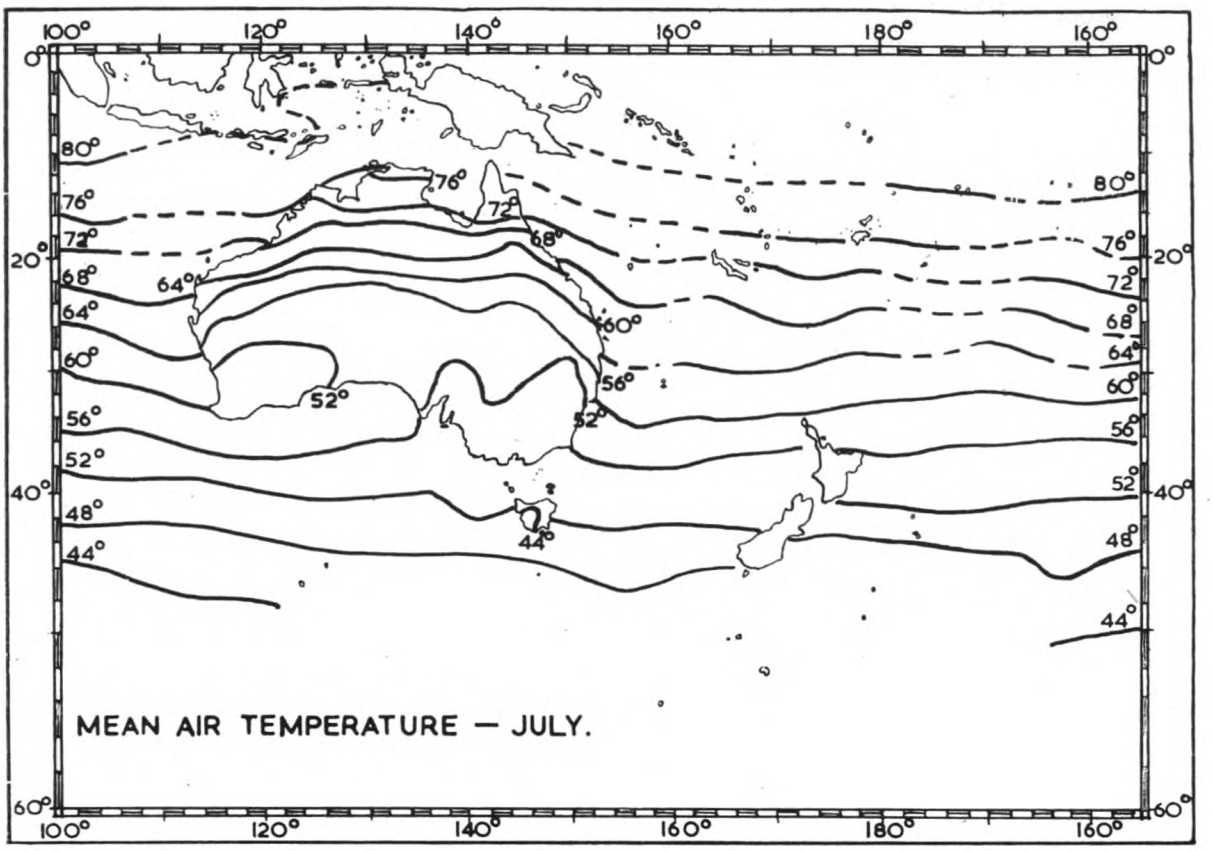


Fig. 6

Ocean forecasts are broadcast twice daily from coastal radios covering all Australian coasts to 300 miles seawards, with selected coastal station reports. Similarly for deep-sea vessels the Australian area is covered by short-wave ocean forecasts between 100°E. and 160°E. longitude. Storm warnings, etc., are broadcast by the coastal radios for the areas affected, and all storm warnings issued for ocean areas in Australia are broadcast also on short-wave by VIS Sydney, via Canberra, in the navigational warning period or as soon as possible after receipt. Advices on weather, etc., may be had upon request to the meteorological authorities in any port in Australia.

THE DANISH LONGSHIP *HUGIN*

BY CDR. C. H. WILLIAMS, R.N.R.

Fig. 1

On the 28th July, 1949, a " Viking " longship was run on to the beach at Martin Main Bay, Broadstairs, in the same manner as had been used by the ancient invaders of this island.

The ship was the *Hugin*, and it is claimed that she is a faithful reproduction of the type of vessel used by Hengist and Horsa in their raids on England in about the year 449 A.D. Her visit to England was to commemorate the 1,500th anniversary of those events.

Built of Danish oak at Frederikssund, Zeeland, she is a large clinker-built open boat, 71 ft. long by 13 ft. beam and with a loaded draft of about 4 ft. She has fine lines, an imposing figurehead standing about 14 ft. above the waterline, and is propelled by sixteen oars on either side and by a large square red-and-white striped sail bent to a yard and hoisted on her single mast. Along either side secured to the gunwhale are the shields of the " warriors " who form her crew. Great care had been taken to have the details of her build and rig correct.

Fig. 2 is a rough sketch of her steering sweep, or stere-board, which was always rigged on the starboard side and from which the term starboard is derived.

The name *Hugin* represents one of the ravens which, according to legend, sat on either shoulder of the ancient god Odin.

The longship had sailed from Esjberg on Monday, 18th July, 1949, in company with the Danish corvette *Thetis*. Except for the comforting presence of this modern escort the *Hugin's* crew lived under the same primitive

conditions as their ancestors had done 1,500 years ago. With a total complement of fifty-three the conditions on board were very crowded. As there is no deck to the vessel they had no shelter from rain and spray, and when a thunderstorm with heavy rain was encountered soon after sailing all hands got pretty wet.

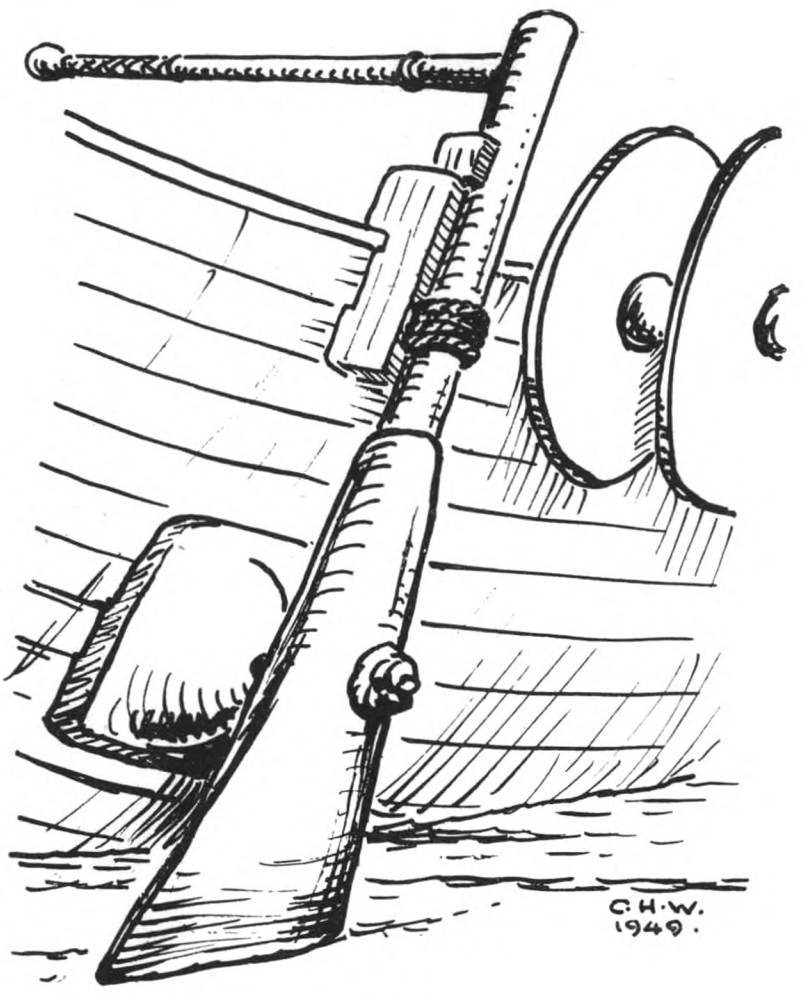


Fig. 2

It is of interest to note that the Weather Bulletin for Shipping for that day gave for the Heligoland area : " Light variable winds. Cloudy with thundery rain or showers. Visibility moderate to poor."

Captain P. C. Jensen was the navigator and was the only professional sailor in the ship. He had served in square-rigged ships when he was a young man, and he stated that the *Hugin* sailed reasonably well and could lay up to about six points from the wind. On the 19th the wind increased to north-west, force 5, which in the open sea was about as much as the ship could stand.

These conditions were forecast in the Bulletin for Shipping on the morning of the 19th as : " Heligoland, moderate to fresh north to north-west winds. Scattered showers. Mainly good visibility." The situation is shown on the tracing of that day's Daily Weather Report Chart (Fig. 3).

A call was made at Ymuiden in Holland, and when the weather moderated the voyage to England was continued. This was probably the method of the ancient days ; the ships following the coast and taking shelter when practicable and necessary.

From then on the *Hugin* had fine weather with light variable winds and made a good passage to the North Goodwin Lightvessel. Here she was anchored to await the time scheduled for the " invasion ". This proved a somewhat dangerous and uncomfortable anchorage, and they were glad when on the 28th July they could weigh and in fine sunny weather approach Broadstairs under oars and sail and run her on the beach as planned.

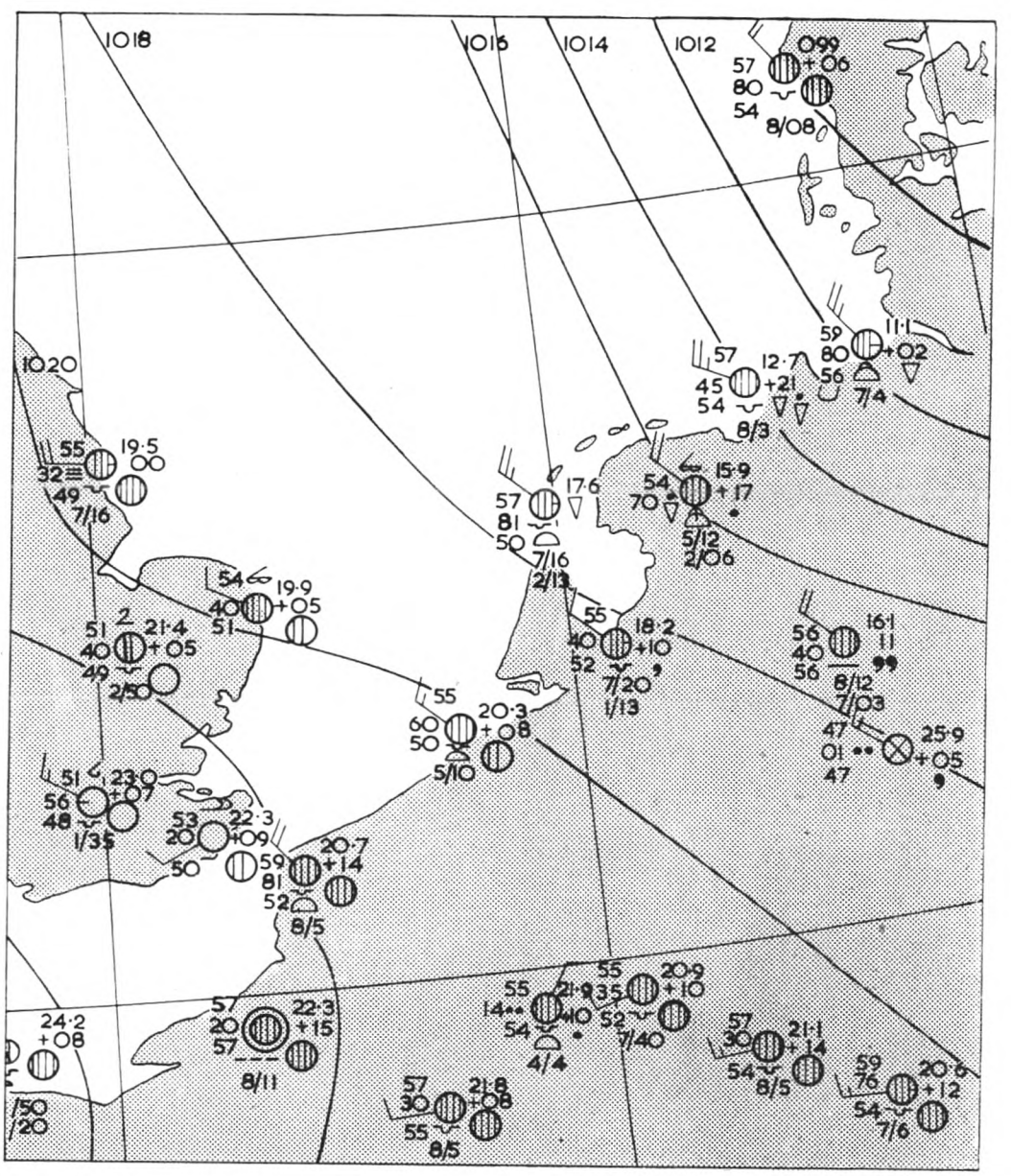


Fig. 3

She was later refloated and on Monday, 1st August, her crew rowed her up the Thames to Richmond, where they received a great welcome. Off Westminster she was " attacked " by a party of " ancient Britons " from St. Thomas's Hospital. The *Hugin* was eventually bought by the *Daily Mail* and exhibited at various British seaside resorts.

PERSONNEL

RETIREMENT.—In December, 1949, on the arrival of his ship the R.M.S. *Andes*, COMMODORE D. A. CASEY, C.B.E., D.S.O., D.S.C., R.D., R.N.R., retired from the Royal Mail Line.

Born at Cahir, Tipperary, Commodore Casey, after two years in H.M.S. *Conway*, served his apprenticeship with the Hall Line from 1907–1910. He joined the Royal Mail Line in 1911 as Fifth Officer of the *Atrato* under Captain J. W. Jellicoe, father of the late Admiral Jellicoe, and rising through the usual grades was appointed master of the *Sarthe* in 1935 and later the *Sambre*.

During the 1914–18 war he served as an R.N.R. officer in submarines and was awarded the D.S.C. In 1939 he was again mobilised, as a Captain, R.N.R., and was Naval officer-in-charge, Poole, during the Dunkirk evacuation. For service during this period he was appointed C.B.E., and later, after returning to sea as Commodore of convoys, was awarded the D.S.O., his citation reading : " For bravery, seamanship and resolution in bringing a convoy from Murmansk in the face of relentless and determined attacks by enemy U-boats and aircraft." Other appointments included " Naval Assistant to the Deputy Second Sea Lord and Admiral Commanding Reserves," and " Deputy Principal Sea Transport Officer, India." Commodore Casey also served as R.N.R. Aide-de-camp to the King in 1944–45.

On returning to the Royal Mail Line in 1947 he commanded the *Highland Monarch* and later the *Andes* as Commodore of the company's ships.

We wish him all health and happiness in his retirement. J. R. R.

RETIREMENT.—In September, 1949, COMMODORE SIR ARTHUR J. BAXTER, K.B.E., D.S.C., R.D., R.N.R., retired from the sea after a long and distinguished career.

He went to sea as an apprentice in 1904 and obtained his second mate's certificate in 1909.

In 1913 Sir Arthur Baxter joined the Orient Line as a Fifth officer, and with the exception of his years with the Royal Navy in both world wars he served in that company until his recent retirement.

Early in the first war he was First Lieutenant of a destroyer and from 1915 till 1919 was in command of destroyers. While in command of H.M.S. *Opossum* he succeeded in destroying the German submarine U.C.49 in the English Channel. For this action he was awarded the D.S.C.

In 1919 he returned to the Orient Line and was First Officer in the *Oronsay*, *Orford* and *Orontes*, until appointed to the command of the *Orsova* in October, 1933 and the *Orford* in 1935. From 1936 to October, 1938, Sir Arthur was ashore as Assistant Marine Superintendent, part of which time he acted as Marine Superintendent owing to the illness of his chief.

He returned to sea in 1938 as captain of the *Otranto* and was in command of her when war broke out. The *Otranto* carried the first contingent of Australian troops to the Middle East and was then on other important trooping voyages, including the evacuation of troops from Brest and the Biscay ports after the collapse of France.

Sir Arthur later served with the Royal Navy with the rank of Acting Commodore, R.N.R., and was appointed a Commodore of Ocean Convoys. He remained on this work for the rest of the war, conducting thirty-seven convoys from various parts of the world.

In February, 1944, he was mentioned in despatches, and in January, 1945, he was appointed K.B.E. (Military Division). From 1944 to 1945 he was A.D.C. to the King.

After the war he commanded the *Orontes* and *Orion*.

All the Orient ships commanded by Sir Arthur contributed weather observations to the Marine Branch of the Meteorological Office.

We wish him health and happiness in his retirement. C. H. W.

RETIREMENT.—In September, 1949, on the arrival of his ship the *Capetown Castle*, CAPTAIN W. D. ROACH retired from the Union Castle Company.

Born at Whippingham, I.O.W., in 1886, Captain Roach went to sea in 1905 as an apprentice in the sailing ship *Zinita*, obtaining his master's certificate in 1914.

He joined the Union Castle Company as a Fourth Officer in the *Sabine* in 1911, and obtained his first command in May, 1939, when he was appointed to the *Sandowne Castle*. He subsequently commanded several Union-Castle liners, finally taking over the *Capetown Castle* in April, 1948.

Captain Roach has been a Voluntary Marine Observer since 1920 and many of his logs have received excellent assessments. We wish him continued health and happiness.

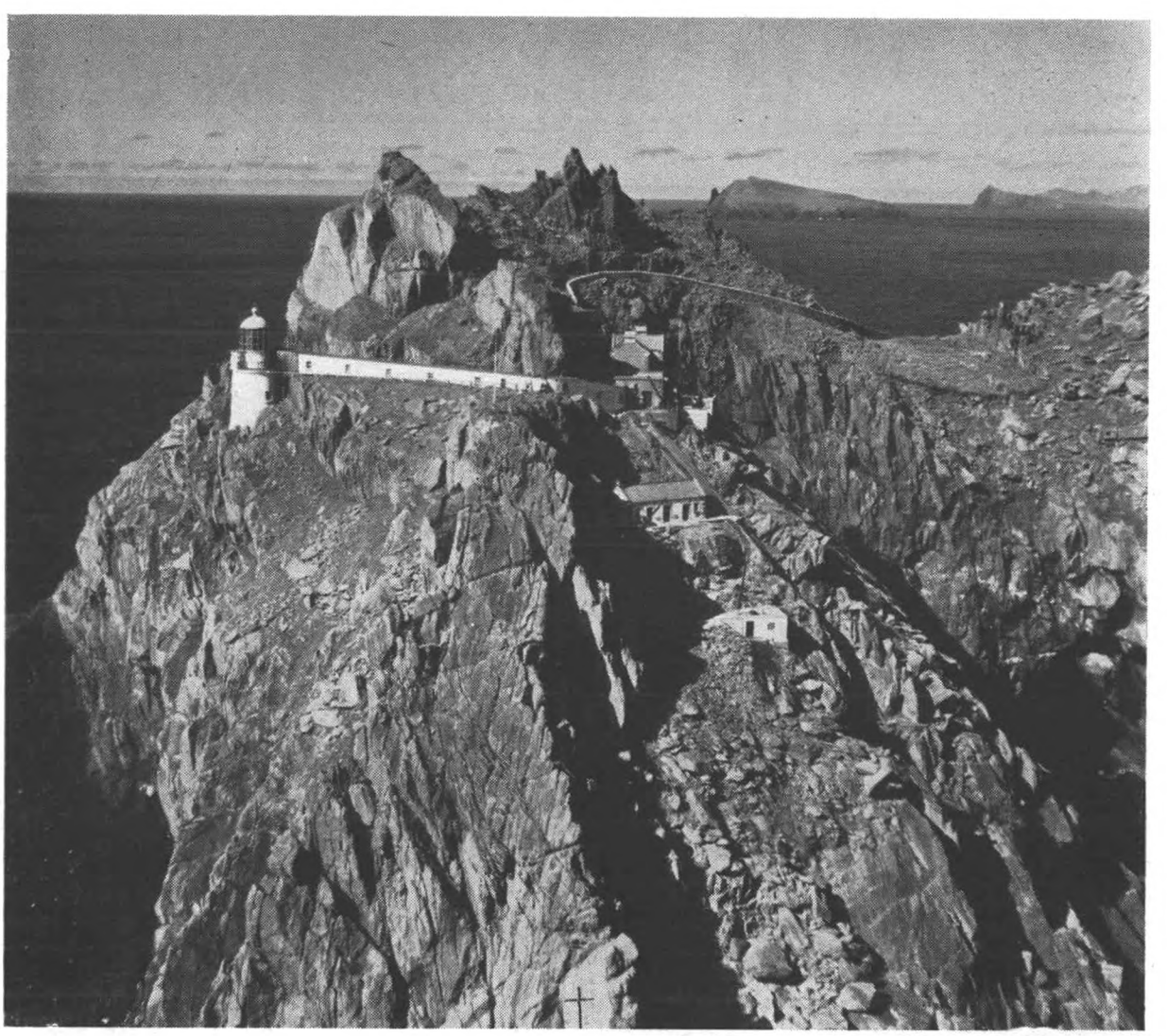
OBITUARY.—It is with regret that we record the death, which occurred suddenly on Monday, 19th December, 1949, of CAPTAIN EDWARD TEMPLETON GRAYSTON, O.B.E., D.S.C., R.D., R.N.R., of the S.S. *Moreton Bay*, of the Shaw Savill & Albion Co. Ltd.

He was born in 1886 and went to sea in 1900. After obtaining his master's certificate in 1910 he joined the Shaw Savill Line in 1913. As a Lieutenant-Commander in the Royal Naval Reserve he served with the Royal Navy in the Great War of 1914–18 and was awarded the D.S.C.

His first command in the company was the *Tairoa*, and in 1931 he subsequently commanded the *Waimana*, *Pakeha*, *Karamea*, *Akaroa* and *Moreton Bay*. Ships commanded by Captain Grayston have figured in the Meteorological Office Fleet List as Selected Ships since 1932.

He was made an officer of the Order of the British Empire in 1939 for saving his ship, the *Karamea*, when attacked by an enemy submarine. C. H. W.

LIGHTHOUSES OF THE BRITISH ISLES



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INISHTEARAGHT

Inishtearaght Lighthouse, viewed here from the S.W., is situated on the western end of Tearaght Island (Lat. 52° 04′N., Long. 10° 40′W.) and is 275 ft. above sea level. Tearaght Island is the westernmost of the Blasket Islands, off the coast of Kerry and to the north of the mouth of Dingle Bay. Inishtooskert and Sybil Point are seen in the background of the photograph

FLEET LIST (Great Britain)

VOLUNTARY OBSERVING SHIPS

The following is a list of British ships, voluntarily co-operating with the Marine Branch of the Meteorological Office.

The names of the Captains, Observing Officers, and Senior Radio Officers are given as ascertained from the last written return received. The date of receipt of the last return received is given in the last column.

All returns received from observing ships will be acknowledged, direct to the ship, by the Marine Superintendent.

The Port Meteorological Officers and Merchant Navy Agents at the ports will make personal calls on the Captains and Observing Officers as opportunity offers, or on notification from the ship at any time when their services are desired. (See under Notices to Marine Observers.)

Excellent awards are made at the end of each financial year. The names of the Captains, Principal Observing Officers and Senior Radio Officers gaining these awards are published in a special list in the *Marine Observer*.

It is requested that prior notification of changes of service, probable periods of lay up, transfer of Captains, or other circumstances which may prevent the continuance of voluntary meteorological service at sea, may be made to the appropriate Port Meteorological Officer or Merchant Navy Agent.

Captains are requested to point out any errors or omissions which may occur in the list.

Name of Vessel	Call Sign	Captain	Observing Officers	Senior Radio Officer	Owners/Managers	Last Return Received
Accra	GJSW	A. Smith	J. R. Smith, L. Austin, C. Morrison, T. A. Holson	J. A. Stuart	Elder Dempster Lines, Ltd.	18.1.49
Afghanistan	GNYB	W. A. Chappell	R. L. Cain, J. Linton, K. J. Evans	T. D. Sullivan	F. C. Strick & Co., Ltd.	3.1.49
Ajax	GJXM	W. T. Spencer	E. B. Bertelsen, C. M. Best, A. S. Curry	C. Calvey	A. Holt & Co.	20.5.49
Akaroa	GMLP	J. Steele	P. S. Yeoman, R. Munro, A. R. Stephenson	J. W. Soulsby	Shaw, Savill & Albion Co., Ltd.	22.3.49
Alcantara	GLQR	G. A. Bannister	J. Fulford, D. Clark, F. Williams	R. E. Hammond	Royal Mail Lines, Ltd.	
Alcyone Fortune	MAQC	T. Bowen-Rees	J. A. Leech		Alcyone Shipping Finance Co., Ltd.	
Amakura	MCPN	S. E. Jenks			Booker Bros., McConnell & Co., Ltd.	
Amastra	GYDD	M. A. Neeves	D. G. Roberts, C. Eastwood, D. Martin	P. Coghlan	Anglo-Saxon Petroleum Co., Ltd.	8.3.49
Amersham	GNTQ	A. Spence	G. Halliday, E. T. Ward, W. Gray	J. Paulley	Thompson S.S. Co., Ltd.	12.8.49
Andes	GQCV	B. K. Berry, R.D., Cmde., R.N.R.	W. B. Avison, F. M. Dickenson, D. Keefe, E. O'Keefe	W. Smith	Royal Mail Lines, Ltd.	30.9.49
Apapa	MACE	J. J. Smith	R. G. Williams, C. A. Smith, J. Wright, S. S. Jenkins, T. A. Nicholson	R. F. Barrett	Elder Dempster Lines, Ltd.	16.12.49
Arabia	GLKF	G. H. Morris	D. H. Shimmin, R. Jones, E. E. Willis	B. H. Long	Cunard White Star, Ltd.	6.1.49
Arabistan	GCKK	J. H. Metcalfe	R. W. Ruddock, R. P. Aske, J. Curtis	A. Hitchen	F. C. Strick & Co., Ltd.	10.3.49
Araby	GMZL	C. E. Mason	K. M. Cutler, P. J. Robinson, J. M. Cree, M. G. Boyd	K. J. Roberts	Royal Mail Lines, Ltd.	19.12.49
Arakaka	GDVN	J. McIntyre	D. Douglas-Kerr, C. Nolan, H. Adler	J. A. Davis	Booker Bros., McConnell & Co., Ltd.	5.8.49
Argentina Star	GTKF	D. R. Macfarlane, D.S.O., O.B.E.	K. White, D. G. Hastie, J. Reeve	C. Hastie	Blue Star Line, Ltd.	7.9.48
Argyll	GBWB	J. Dodds	A. W. Fielding, T. R. Rowe, F. V. Johnson	J. J. Downey	B. J. Sutherland & Co., Ltd.	16.1.50
Ariguani	GMBL	G. S. Gracie	R. D. Phillpotts, J. A. Cruickshanks, J. B. Hughes	A. N. Taylor	Elders & Fyffes, Ltd.	4 1.49

Name of Vessel	Call Sign	Captain	Observing Officers	Senior Radio Officer	Owners/Managers	Last Return Received
Artisan	MAFK	W. Moore	C. A. V. Dalyn, J. Cubbin, P. O. Donnell, N. Acon, A. P. Sandford	C. Clancy	T. & J. Harrison	19.11.49
Ashburton	GNJN	F. W. Mould	C. F. Woodcock, D. A. Keats, L. Browne	J. S. Buchanan	Trinder Anderson & Co.	14.11.49
Asia	GLJV	B. Harrison	C. A. Roy, D. S. Lomax, D. J. Steff, —. King	W. J. Rainey	Cunard White Star, Ltd.	
Asturias	GLQS	G. A. Banister	—. Cutler, —. Rutter, —. Edwards	—. Hunt	Royal Mail Lines, Ltd.	18.3.48
Athelchief	GCRG	J. H. Flockhart	R. V. Parhiss, N. Jones, A. Green	W. Bradbury	Tankers, Ltd.	16.1.50
Athelregent	GQWL	W. A. Meneight	R. Nicholson, R. McGregor, W. H. Buckle	A. Williams	Athel Line, Ltd.	4.1.50
Athenic	GBLS	D. Aitchison	J. N. Carroll, J. W. Webster, J. W. Wood, R. F. Abbey	D. Haggart	Shaw, Savill & Albion Co., Ltd.	28.9.49
Athlone Castle	GYTK	J. McReynolds, D.S.C.	J. Pascoe, K. McNish	J. H. Summers	Union Castle Mail S.S. Co., Ltd.	30.12.49
Atlantis	GLTM	A. R. Osborne	R. Phillips, M. Bialowski, E. J. Burrough	H. Matthews	Royal Mail Lines, Ltd.	2.11.49
Auricular	GKPV	H. Sangster	C. K. Powell, C. Close, G. Blackwood	J. Casey	Anglo-Saxon Petroleum Co., Ltd.	20.8.49
Australia Star	GYCS	G. M. Duff, G.M.			Blue Star Line, Ltd.	12.8.48
Australind	GJKF	J. F. Wood	D. Ewan, J. B. McGowan, R. Mattingley	H. J. Griffiths	Trinder, Anderson & Co.	8.11.49
Avondene	MAWG	W. J. Jones	J. R. Dixon, R. L. Jones	J. Smallwood	Dene Shipping Co., Ltd.	8.11.49
Balaena	GLDG	P. Virik			United Whalers, Ltd.	
Balantia	GBNM	F. A. C. Thacker	G. A. Dando, W. C. L. Sturrock, G. L. Fraser, R.D., R.N.R.	J. J. Mytton	Royal Mail Lines, Ltd.	16.1.50
Baltara	GTXM	G. E. Thomas	E. E. R. Roberts, R. E. G. Simmons, —. Davies	C. James	United Baltic Corporation, Ltd.	4.1.49
Banff Park	GPYZ	E. Bursby	T. Burke, G. Dunn, R. Rutherford	J. Spicer	Ohlson S.S. Co., Ltd.	27.5.47
Baron Maclay	GKXW	A. Campbell	R. Pollok, J. Baxter, R. Gunn	J. Freel	H. Hogarth & Sons	28.9.49
Baron Yarborough	GNJD	A. Irvine	D. Harlock, R. Cameron, A. J. Hutcheson	J. Dowdall	H. Hogarth & Sons	
Baskerville	GPYF	E. Pugh, O.B.E.	J. Lungley, —. Knight, P. T. Dennison	W. Maclaren	Runciman (London), Ltd.	2.11.49
Bassano	GNXK	D. B. Ramsbottom, D.S.C.	F. Smith, J. Peck, J. B. Harbord	G. Shilson	Ellerman's Wilson Line, Ltd.	28.9.49
Beaconsfield	GNNQ	J. W. Gardiner	A. J. Cox, A. Ferguson, M. G. King	A. D. Garden	Watts, Watts & Co., Ltd.	30.11.49
Beaverburn	MAGB	J. B. Smith, O.B.E.	S. Fieldhouse, T. F. Hercus, A. Aikman	T. Ainsworth	Canadian Pacific S.S., Ltd.	26.1.49
Beavercove	GNLX	C. E. Duggan, R.D., R.N.R.	D. P. Blois, R. D. P. Gillett, J. H. Fraser, R. R. Rawlings	J. A. McAskill	Canadian Pacific S.S., Ltd.	20.12.49
Beaverdell	GBBS	S. W. Keay, O.B.E.	R. W. Savage, W. Williams, G. Lawson	L. Norton	Canadian Pacific S.S., Ltd.	11.1.49
Beaverford	MQJG	R. A. Leicester, O.B.E.	E. R. Connerton, E. R. Shaw, D. Wallace	W. Poingdestre	Canadian Pacific S.S., Ltd.	11.1.49
Beaverglen	GBCP	J. Soame	L. Kinns, D. Bryce, J. Mackay, D. Robertson	R. Burch	Canadian Pacific S.S., Ltd.	21.9.48
Beaverlake	GBCQ	C. L. de H. Bell, D.S.C., R.D., Capt., R.N.R.	G. W. Bateman, G. Palmer, J. Waling	A. P. Humphries	Canadian Pacific S.S., Ltd.	7.12.48
Beckenham	GCGK	D. G. Martin	J. W. Gardiner, E. Peirce, J. L. Kirby	J. Brennan	Watts, Watts & Co., Ltd.	12.8.49
Benarty	GCZZ	D. S. Sinclair	A. King, A. Addison, J. Amos	R. Dixon	W. Thomson & Co.	20.9.49
Bendoran	MYSF	H. Masson	R. Winn, K. Parker	J. E. Kemp	W. Thomson & Co.	
Benledi	GDBJ	J. Liston	P. Angus, W. Ovens, J. M. Bain	B. J. Saltwell	W. Thomson & Co.	16.1.50
Benmhor	GDVV	J. D. Wilson	J. Brown, J. T. Fyffe, E. H. Booth	H. Mackay	W. Thomson & Co.	16.12.48
Benreoch	GDJT	J. B. Hastie	L. C. Finn, R. M. Snowie, N. Mackie	I. M. Fraser	W. Thomson & Co.	13.5.49
Benvrackie	GBTZ	W. C. Wilson	W. O. Atkinson, J. Clements, I. Bruce, A. J. King	J. L. Wells	W. Thomson & Co.	12.10.49
Benwyvis	MYPW	K. Hardie	E. N. Stone, G. Speirs, G. K. Harrison	J. Whyman	W. Thomson & Co.	26.1.49
Bibury	GIFC	W. E. Brett	F. E. Barley, D. L. Craven, R. Brooks	R. G. Thomson	Houlder Bros. & Co., Ltd.	9.3.49
Biscoe	GDCW	D. Cornwell			Hector Tankers, Ltd.	
Boynton Wyke	GBZV	G. Clixby			West Dock Steam Fishing Co., Ltd.	
Bransfield	GDRK	F. A. Gjertsen			United Whalers, Ltd.	

Brasil Star	GTLF	G. Duff, G.M.	L. J. Thompson, F. P. McGuckin, D. McPhail	J. Waddell	Blue Star Line, Ltd.	22.11.49
Bravo	GLDZ	H. Tyler	C. Everingham, J. McAndrew, J. H. Spandler	F. E. Smith	Ellerman's Wilson Line, Ltd.	
Brisbane Star	GZCJ	S. Foulkes	R. H. Stark, M. R. Bremberg, G. Munro, A. H. White	D. J. Eastwood	Blue Star Line, Ltd.	19.5.48
Britannic	GDXF	C. I. Thompson	M. J. Dodds, R. McDougall, J. Rawlinson	—. Kidson	Cunard White Star, Ltd.	4.9.48
British Colonel	GFDB	A. Derrick	W. S. Jaeger	R. A. MacLeod	British Tanker Co., Ltd.	11.1.50
British Endeavour	GFCN	J. E. Stead	J. Irvine		British Tanker Co., Ltd.	
British Endurance	MLZM	W. Watkin-Thomas, O.B.E., D.S.C.	A. D. Millar, S. H. Falconer, P. C. Coyne	A. E. Adams	British Tanker Co., Ltd.	29.12.47
British Energy	GLBK	R. Smyth	P. Edmondson, S. E. Banyard, N. J. Price	J. Cochrane	British Tanker Co., Ltd.	6.1.50
British Escort	GCRB	H. G. Jeary	J. A. G. Millar, R. Weston, I. McKay	A. Murray	British Tanker Co., Ltd.	15.6.49
British Hussar	GJVR	R. Phillips	A. P. Watson, G. W. Reeve, A. V. Sard	A. John	British Tanker Co., Ltd.	
British Lancer	MAGS	T. S. Hall	K. W. Nicholls, E. G. Freeman, C. G. Cowdry, C. Onslow	C. R. A. Ball	British Tanker Co., Ltd.	20.9.49
British Marquis	GWVL	J. W. Kemp	E. L. Mitchinson, C. F. Williams, P. Dawson	R. Lee	British Tanker Co., Ltd.	25.10.49
British Patience	GUFF	J. Beatie	J. H. Picken, S. B. Wade, P. Budge, C. Herbert	R. Stevenson	British Tanker Co., Ltd.	25.8.49
British Pilot	GCQT	J. H. Nelson	L. McRitchie, T. McDonald, W. Charsville	L. Bulmer	British Tanker Co., Ltd.	12.9.49
British Piper	GDNN	J. P. M. Samson	A. F. Bowan, B. H. Moore, C. A. Patterson	M. A. H. Kenneison	British Tanker Co., Ltd.	16.11.49
British Power	GZGG	K. M. Mitchell	A. Fraser, P. F. Mason, E. C. Ford	F. G. Rimmington	British Tanker Co., Ltd.	15.10.48
British Prestige	GMBF	J. H. Wilson	J. A. Macleod, T. Horne, G. A. Gee	F. Giuller	British Tanker Co., Ltd.	24.2.49
British Resource	GFCD	J. C. Lee			British Tanker Co., Ltd.	
British Respect	MAGU	C. W. G. Stook	R. Maybourn		British Tanker Co., Ltd.	
British Statesman	GJNR	E. L. Mitchinson	B. Halvorsen, T. J. Taylor, A. C. Robinson	W. I. Briggs	British Tanker Co., Ltd.	28.9.49
British Swordfish	GCQV				British Tanker Co., Ltd.	
Brittany	GMZS	H. A. Wright	J. Fox, J. Kavanagh, —. Wood	G. Mitchell	Royal Mail Lines, Ltd.	23.2.49
Brockleymoor	GDWP	D. J. Jones	F. K. Venus, G. Ball, J. S. Clarke	N. W. Hodgson	Walter Runciman & Co., Ltd.	26.11.49
Bronte	GSKW	E. L. Jermyn	L. A. Sayers, Lt.-Cdr., W. T. Pitcher, B. E. Cole	T. J. Keily	Lamport & Holt Line, Ltd.	18.9.48
Byron	GNFL	J. Byrne	F. Gribben, J. Roberts, R. Garcia	T. Scambler	Lamport & Holt Line, Ltd.	7.3.49
Cairnavon	GPJN	J. W. Scott	C. Sutherland, C. Percy, J. Holland	W. P. Greaves	Cairns, Noble & Co.	10.10.49
Cairnesk	GMKR	I. G. Foster	J. Hogg, W. Errington, J. Baxter, R. Campbell	E. Johnston	Cairns, Noble & Co.	12.10.49
Cairnvalona	GQKM	G. R. Norvell	N. E. Forth, J. W. Cuthbertson, T. D. Ridley, J. Nelson	T. W. Lawson	Cairns, Noble & Co.	8.11.49
Caledonia	GCKR	E. Stormont, M.B.E.	W. Thompson, T. L. Langlands, G. Murdoch, A. McAdam	S. J. D. Taylor	Anchor Line, Ltd.	9.11.49
Canton	GDDT	G. Stable	G. S. Gordon-Christian, J. M. Donkin, C. E. R. Waller	J. R. C. Johnson	P. & O. Steam Navigation Co.	14.12.48
Cape Mariato	GZFV	F. Yeomans	R. N. Dixon	R. N. Dixon	Hudson Bros. Trawlers, Ltd.	13.2.47
Cape York	GCZS	H. S. Todd	D. E. Cormack, G. O. Lambert, I. Thomson	S. Gracie	Lyle Shipping Co., Ltd.	14.6.48
Capetown Castle	GKGM	R. Wren, D.S.O.	R. A. Dugdale, H. Madden, C. R. Kelso	J. Gilbert	Union-Castle Mail S.S. Co., Ltd.	16.1.50
Carlton	GIFE	K. Wardale	A. Dodd, W. A. Morriss, A. A. Abdullah	J. Park	R. Chapman & Son	20.4.49
Caroma	GYKS	D. W. Sorrell	I. C. Borland, P. F. Drake, R. Ibbertson, J. A. Matthews	J. Parsons	Cunard White Star, Ltd.	
Carthage	GRNX	S. H. French	D. Parsons, P. J. Passmore, D. T. Bolas	W. H. Chick	P. & O. Steam Navigation Co.	4.1.49
Caslon	MCJR	J. M. Cherry	L. C. Burton		Runciman (London), Ltd.	
Cavina	GKFV	S. A. Sapsworth	R. Laycock, B. Noble, D. Hamilton	A. E. Morton	Elders & Fyffes, Ltd.	21.1.49
Caxton	GCDX	R. E. Richardson	F. Hamilton, R. Crawford, J. G. Wilson	A. Austin	Runciman (London), Ltd.	19.1.49
Celtic Monarch	GSRF	R. L. Barr	E. C. Muir		Raeburn & Verel, Ltd.	19.3.48
Ceramic	GFLM	A. V. Richardson	P. Goodson, W. Foster, H. M. Hignett	H. Littlecot	Shaw, Savill & Albion Co., Ltd.	24.9.49

Name of Vessel	Call Sign	Captain	Observing Officers	Senior Radio Officer	Owners/Managers	Last Return Received
Cerinthus	GCRM	J. F. Auld	B. P. Payling, D. J. Stone	C. Hagon	Houlder Bros. & Co., Ltd.	22.12.49
Cheshire	GLXV	P. H. Potter	D. Hine		Bibby Bros. & Co.	
Chinese Prince	GDJC	F. S. Thornton, O.B.E.	M. Musson, H. Jennings, H. Bragg, C. Farmer, M. Howell	T. Bailey	Prince Line, Ltd.	25.7.49
Chitral	GLKN	D. Hockly	J. A. P. Crichton, E. Snowden, J. A. Lefevre	A. R. Porter	P. & O. Steam Navigation Co.	25.11.49
Chupra	GDZV	J. D. Woods	R. W. Allerton, H. S. F. Strawbridge, W. L. Hillcoat	R. C. Whiting	British India Steam Nav. Co., Ltd.	13.10.48
Cilicia	GDGL	R. Blake	D. McDiarmid, R. Ballantyne, A. MacKendrick	J. Malcolm	Anchor Line, Ltd.	10.10.49
City of Barcelona	GTKR	N. Groundwater	A. M. Bowman, P. Appleton, R. E. Greenwood	W. Dobbie	Ellerman Lines, Ltd.	10.1.50
City of Bristol	GCPN	G. Vickers	W. E. James, D. Cumming, R. A. Reid, V. Y. Dymock	K. P. Grocock	Ellerman Lines, Ltd.	16.11.49
City of Calcutta	GLYX	H. A. Hazeel	D. J. Inglis, I. McDermid, N. Dalziel, A. J. Bickerton	T. H. Murray	Ellerman Lines, Ltd.	12.7.49
City of Capetown	GBBQ	W. S. Coughlan, O.B.E.	W. E. Fletcher, P. Redhead, A. Ramsden	D. S. Crombie	Ellerman Lines, Ltd.	15.8.49
City of Carlisle	GBJK	L. E. Smith, M.B.E.	J. Irvin, W. Taggart, B. Pickering	P. J. McKean	Ellerman Lines, Ltd.	19.12.47
City of Chester	MAHN	E. M. Robertson	B. Williams, E. Cumming, R. E. Garisch	J. Ellis	Ellerman Lines, Ltd.	30.12.49
City of Delhi	GLBW	J. W. Wotherspoon	J. P. Mason-Price, I. Irvine, W. Smith	A. Dennis	Ellerman Lines, Ltd.	8.11.49
City of Derby	GFWC	W. A. Hannah	R. Tyrrel, J. Twomey, R. Huntingdon	R. Macdonald	Ellerman Lines, Ltd.	30.8.49
City of Dieppe	GSVQ	E. G. Chapman	J. Thompson, M. Graham, D. Roe	R. M. Jones	Ellerman Lines, Ltd.	30.12.49
City of Dundee	GDPY	F. M. Womersley	R. Jones, J. A. Whieldon, L. G. Powell	H. M. O'Gorman	Ellerman Lines, Ltd.	26.1.49
City of Durham	GBJM	H. G. Williams, O.B.E.	D. S. Taylor	W. B. Noonan	Ellerman Lines, Ltd.	21.3.49
City of Evansville	GJNF	D. C. Hamilton	A. Fry, J. S. Schofield, J. Checkley	J. Oultram	Ellerman Lines, Ltd.	14.11.49
City of Exeter	GQZW	R. P. Longstaff, D.S.C.	T. Lovell, J. W. Terris, H. McL. Farquhar	G. S. Creighton	Ellerman Lines, Ltd.	20.9.49
City of Hereford	GMXC	G. A. Ring	T. Rigg, J. F. Mason	S. C. Ombler	Ellerman Lines, Ltd.	25.1.49
City of Johannesburg	GBKW	A. G. Freeman	H. Routledge, H. Lewis, C. Craddock	A. R. Henderson	Ellerman Lines, Ltd.	4.1.49
City of Khartoum	GBZC	J. A. Beynon	D. L. Cox, W. Folder, D. A. Appleton	J. Dolan	Ellerman Lines, Ltd.	5.11.48
City of Lille	GSLN	W. A. Owen	R. B. May, H. M. Steele, G. S. Garner	A. Julius	Ellerman Lines, Ltd.	14.11.49
City of Lyons	GMCN	F. Barnard	A. R. Horam, R. Clark, J. Morrison	W. Anderson	Ellerman Lines, Ltd.	29.3.49
City of Paris	GFQM	H. Percival, O.B.E., R.D., Cdr., R.N.R.	P. S. Morrison, M. A. Perry, R. N. Caldwell	B. Holyoake	Ellerman Lines, Ltd.	14 11.49
City of Pretoria	GBLN	R. F. Jefferies	R. Bushell, F. Braddick, W. Taggart, E. Ridge	J. Booth	Ellerman Lines, Ltd.	
City of Swansea	GBZT	G. Vickers	T. C. Dickinson, P. Seiffert, K. Haslam	W. Lupton	Ellerman Lines, Ltd.	25.5.48
City of Sydney	GSFM	J. B. MacLaren	B. Walker, J. Blanch, E. E. Cooper	H. D. Smythe	Ellerman Lines, Ltd.	24.8.49
City of Tokio	GFMW	R. L. Stewart	E. Bonfield, R. H. Bellhouse, E. Redshaw	—. McTighe	Ellerman Lines, Ltd.	
City of Windsor	GJYR	W. S. Doidge	T. Rigg, M. Graham, E. F. Brick	A. C. Macaulay	Ellerman Lines, Ltd.	5.11.48
Clan Brodie	GKPD	W. Vernon-Browne	W. Kendal, S. F. Nicholson, E. J. E. Owen	W. M. Morrison	Cayzer Irvine & Co., Ltd.	4.1.49
Clan Buchanan	GKNM	T. W. Inman, O.B.E.	J. H. Wright, F. King, W. T. Richardson	W. Harper	Cayzer, Irvine & Co., Ltd.	10.12.49
Clan Campbell	GDZK	J. A. Forster	D. S. Tosh, E. M. Crawley, J. Beynon, J. Hay	R. F. Cole	Cayzer, Irvine & Co., Ltd.	4.1.49
Clan Chattan	GFBX	H. C. Simpson, O.B.E.	F. Turton, J. W. Ward, N. Geeson	J. Shillabeer	Cayzer, Irvine & Co., Ltd.	25.10.49
Clan Chisholm	GFBY	C. Crellin	R. S. Russell, A. G. Allson	J. A. Gray	Cayzer, Irvine & Co., Ltd.	26.4.49
Clan Davidson	MAWU	H. J. Anchor, O.B.E., R.D., R.N.R.	A. M. Kennedy, E. R. Smith, D. R. Godfrey, P. Ingram	J. E. Appleton	Cayzer, Irvine & Co., Ltd.	19.1.50

Clan Forbes	GPGB	T. W. Ellis	F. C. Doyle, A. T. Campbell, C. J. Abbott	W. H. Saville	Cayzer, Irvine & Co., Ltd.	4.1.49
Clan Macaulay	GZCS	A. G. Storkey	T. R. Halliday, M. P. R. Turner, D. S. Clark	J. Ormerod	Cayzer, Irvine & Co., Ltd.	12.7.49
Clan MacDonald	GCPG	H. Cater	J. P. Dunphy, F. Lionnet, D. Milner	G. Martyn	Cayzer, Irvine & Co., Ltd.	7.12.48
Clan Macdougall	GFBQ	P. McMillan	S. R. J. Woods, J. A. Molyneux, D. E. Milner	C. E. C. Crew	Cayzer, Irvine & Co., Ltd.	16.12.49
Clan Maclaren	GSSC	E. H. O. Stone	T. O. Marr, Lt.-Cdr., R.N.R., J. A. Baxter, D. Richardson	R. W. Moore	Cayzer, Irvine & Co., Ltd.	11.10.49
Clan MacNair	GFNK	J. Dumphy	A. Mair, A. Graham, J. Brackenridge	R. D. Dingley	Cayzer, Irvine & Co., Ltd.	16.1.50
Clan Macneil	GFWP	J. West	J. A. N. Laws, K. M. Thomson, H. J. Jakobsons	M. P. Clarkson	Cayzer, Irvine & Co., Ltd.	24.11.49
Clan Macrae	MAHP	T. W. Ellis, O.B.E.	J. D. W. Chapple, R. E. Heywood, J. Nichols	W. Bryce	Cayzer, Irvine & Co., Ltd.	7.3.49
Clan Mactavish	GUBB	R. P. Galer, C.B.E., R.D., R.N.R.			Cayzer, Irvine & Co., Ltd.	
Clan Urquhart	GFBK	C. C. Parfitt	W. Graham, M. N. Ure, T. N. Geesin	A. F. MacIntyre	Cayzer, Irvine & Co., Ltd.	8.3.49
Clearpool	MAHQ	J. Whamond	G. Radcliffe, I. Isaak, A. Pringle	R. R. Bromham	Sir R. Ropner & Co., Ltd.	
Clydebank	GKLM	J. W. Greig	B. H. Smith, A. R. Howson, E. A. D. Vargas	A. G. Roberts	Andrew Weir & Co., Ltd.	30.12.49
Clydefield	GSNK	A. S. Reid	P. B. Goudie, J. C. Wheeler	J. Layton	Hunting & Son, Ltd.	28.7.49
Columbia Star	GQGT	C. J. W. Jones	L. Tessier, A. G. Smith, B. Edginton	J. Lovelock	Blue Star Line, Ltd.	16.7.48
Comanchee	GYRX	O. W. Shepheard	P. Davies, D. Rees, I. D. A. Macintosh	J. Kelleher	Esso Transportation Co., Ltd.	10.12.49
Comedian	GPTJ	R. L. Williams	J. Bean, L. Broadbent, A. Waring	J. Pye	T. & J. Harrison	28.10.49
Comliebank	GKLJ	J. Robertson	A. J. Whiston, A. Brown, E. J. Stoddart	R. Holding	Andrew Weir & Co., Ltd.	1.6.49
Condesa	MAHU	H. Heal	R. Tinmouth, S. Edgington, D. Parkin	J. Bishop	Furness-Houlder Argentine Lines, Ltd.	6.9.49
Consuelo	GCGQ	H. Greenhill	C. Everingham, H. Riley, A. D. Hutchinson, N. Bilitch	J. R. Eastwood	Ellerman's Wilson Line, Ltd.	12.10.49
Corfu	GRNW	C. S. Parker			P. & O. Steam Navigation Co.	
Corinthic	GZYL	G. M. Robertson, D.S.C.	B. E. Mahy, J. W. Woodbridge	B. O. Baxter	Shaw, Savill & Albion Co., Ltd.	30.9.49
Corrientes	GFPT	W. Anderson	R. Allan, C. Martin, R. Aitken, J. H. Stark	J. Couchman	Donaldson Bros. & Black, Ltd.	13.7.49
Coulgorm	MAHZ	G. Robison	W. F. Kelly, T. F. Tuomey, J. Ridley	R. Andrews	Lambert Bros., Ltd.	16.12.48
Craftsman	GPZT	W. F. O'Neill	T. W. Kent, G. Cubbin, C. J. Burtinshaw	R. J. Francis	T. & J. Harrison	6.9.49
Cumberland	GPPY	H. E. Reilly, D.S.C., R.D., R.N.R.	P. M. N. Busby, N. Etherton, R. G. Ford	T. J. Constable	Federal Steam Nav. Co., Ltd.	24.11.49
Dallas City	GCLS	D. W. Boutcher	T. W. D. John, P. H. Banks, A. M. Robson	G. Lowe	Sir William Reardon Smith & Sons, Ltd.	2.12.49
Darro	MAID	W. H. Grimshaw, O.B.E.	J. Green, R. J. Kistler, J. C. Derby, J. S. Kent	J. B. Smith	Royal Mail Lines, Ltd.	30.12.49
Debrett	GRPR	J. King			Lamport & Holt Line, Ltd.	
Deebank	GTDB	B. Rivett	G. T. Clarke, R. Clarke, A. H. Pickles	A. A. Macpherson	Andrew Weir & Co., Ltd.	27.10.49
Defoe	GNWF	W. C. Blake	K. Maguire, M. C. Roberts, D. Simpson	M. C. Pickering	Lamport & Holt Line, Ltd.	11.1.50
Delane	MMNW	H. Pratt	B. M. Metcalfe, L. J. Roberts, C. T. Skrastin	J. Care	Lamport & Holt Line, Ltd.	11.1.49
Delilian	GJSQ	R. McNie	W. S. Kerr, J. H. Small, D. Hindman	W. J. Reid	Donaldson Bros. & Black, Ltd.	23.6.49
Delius	GZSY	H. W. Underhill	W. Jones, A. Bennett, B. Walker	R. Pryer	Lamport & Holt Line, Ltd.	5.10.49
Denbighshire	GQGW	D. Hey	E. G. Painter, L. Henshall, M. Webb	G. Heapy	Glen Line, Ltd.	2.6.49
Derryclare	GCKN	G. Smith	E. T. Paddon, D. Kingsland	G. Williams	McCowen & Gross, Ltd.	13.6.49
Deseado	MAIH	S. J. G. Hill	W. B. Avison, R. D. Jones, B. A. Wood, N. F. Seaton, P. C. T. Davies	W. Devereux	Royal Mail Lines, Ltd.	20.9.49
Devis	GFKT	T. J. Sweeny	D. H. Cadova, G. Shackleton	L. Brazill	Lamport & Holt Line, Ltd.	9.7.48
Devon	GDRF	A. Hocken	R. Stewart-Scott, J. D. Cubitt, R. D. Baillie, J. D. Hellings	L. Carter	Federal Steam Nav. Co., Ltd.	8.11.49
Devonshire	GTTV	A. Beharrel	J. Farrow, R. Driver, F. Hughes	J. Fletcher	Bibby Bros. & Co.	12.2.49

Name of Vessel	Call Sign	Captain	Observing Officers	Senior Radio Officer	Owners/Managers	Last Return Received
Dominion Monarch	GRGG	Sir Henry Gordon, K.B., D.S.C.	—. Clarke-Lens, —. Beaumont-Jones, H. A. Howe	—. McMurray	Shaw, Savill & Albion Co., Ltd.	18.8.49
Dorelian	GJTL	D. MacQueen	A. J. Dougall, D. Brown, D. Langwell	J. Cooper	Donaldson Bros. & Black, Ltd.	5.12.49
Doris Clunies	MSLB	J. G. Stevenson	J. B. Whyte, K. M. Hamilton, W. D. Blingow	G. M. Hargreaves	Clunies Shipping Co.	4.11.48
Drina	MAIL	D. R. Miller	C. A. Miller, M. Mortimer, P. C. T. Davies	A. Allen	Royal Mail Lines, Ltd.	20.9.49
Dromore	GDSF	C. S. Fryer	J. McCool, S. N. Coe, D. Beighton	R. H. Heard	Furness, Withy & Co., Ltd.	20.9.49
Dryden	MQFT	J. A. Little	K. Quirk, M. Fair, W. Overhill	J. Gerrity	Lamport & Holt Line, Ltd.	28.9.49
Duke of Athens	GMYS	J. G. Lomas, A.I.N.A.	T. Walton, L. Labistour, J. G. Perrin	D. R. Uglow	Trent Maritime Co., Ltd.	24.2.49
Dunera	GBBR	A. A. Kay	G. Pugh, C. R. S. Monk, A. Ford	A. McCartney	British India Steam Nav. Co., Ltd.	
Eastern	GFTV	H. C. G. Stratford	D. Simon, D. Elkington, D. Grant	E. C. Bouel	Eastern & Australian S.S. Co., Ltd.	28.3.49
Edinburgh Castle	GOHN	T. W. McAllen	G. D. Attwood, W. G. Shaw, J. W. Rogers	J. Hodgson	Union Castle Mail S.S. Co., Ltd.	28.9.49
Edward East	GYXZ	J. A. Whittleton			H. Croft Baker & Sons, Ltd.	
El Gallo	MAIP	P. Pederson	J. Smith, D. O. Robertson, J. Channing-Pearce	A. J. Lunt	C. T. Bowring & Co., Ltd.	4.1.50
Empire Brent	GLBX	J. Cook	J. Kinniburgh, D. Brown, S. Ewing	L. Hooper	Donaldson Bros. & Black, Ltd.	7.12.49
Empire Halladale	GPVQ	J. McGill Brown	G. Ramage, W. A. Brownlie, W. Marshall	D. Thompson, M.B.E.	Anchor Line, Ltd.	30.8.49
Empire Martaban	GBSV	E. Longster	G. McGowan, D. B. Butler	T. M. Keddie	Bolton S.S. Co., Ltd.	19.6.47
Empire Orwell	GRCB	A. C. G. Hawker, C.B.E., R.N.R. (Ret.)			Orient Steam Nav. Co., Ltd.	
Empire Pride	MAJB	R. Cuming, D.S.C.	R. D. Fielder, R. Hammond, A. Cameron	A. Mallett	Bibby Bros. & Co.	5.8.49
Empire Star	GCDP	G. E. Barnard	T. Hender, M. R. Bremberg, J. Edwards, P. Ellett	H. Smith	Blue Star Line, Ltd.	28.10.49
Empire Towy	GDKL	M. L. Thomas	D. G. Grest	G. R. Stuart	Fenton S.S. Co., Ltd.	5.8.49
Empire Viceroy	MAJN	J. B. S. Bland	A. C. Cable, A. Purvis, D. L. Jardine	R. Porter	Pandelis Shipping Co., Ltd.	4.11.47
Empress of Australia	GFSB	C. E. Duggan, R.D., R.N.R.	A. G. Ingram	W. Campbell	Canadian Pacific S.S. Ltd.	15.12.48
Empress of Canada	GSVR	E. A. Shergold	A. H. R. Peace, R. Walgate, J. H. Fraser, B. Snell	J. M. Butterworth	Canadian Pacific S.S., Ltd.	28.11.49
Empress of France	GNTV	B. B. Grant, R.D., R.N.R.	J. M. Brackenridge, R. G. Roberts, J. Richardson	D. Murphy	Canadian Pacific S.S., Ltd.	7.12.49
Epsom	GCYD	R. D. Griffiths, O.B.E.	G. T. Sharpe, R. M. King, E. M. Thomson	R. T. Jones	Watts, Watts & Co., Ltd.	20.7.49
Eros	GYSB	R. C. Vigurs	V. Irving, C. P. Turquand, M. L. Mitchell	R. McEwan	Steamship Eros, Ltd.	2.12.49
Esperance Bay	GSMP	T. V. Roberts, R.D., Cdr., R.N.R.	J. K. Wyles, J. F. Scott, D. M. Bradley	M. J. Sheehan	Shaw, Savill & Albion Co., Ltd.	20.9.49
Essex Trader	GCMS	C. Arundell	W. Kemp, F. Stamps, D. Harris	A. B. Pilkington	Trader Navigation Co., Ltd.	29.11.49
Esso Glasgow	GTXC	C. G. Broughton	R. J. Davies, J. C. Young, D. J. Harrison	P. J. Everett	Esso Transportation Co., Ltd.	14.11.49
Explorer	GYJX	J. Curle	J. L. Williams, G. Cubbin, R. H. Soar	G. A. Bart	T. & J. Harrison	6.1.49
Fanad Head	GNQQ	W. A. Haddock	A. Fee, J. Harper, C. R. Wilson	A. J. Thomson	G. Heyn & Sons, Ltd.	20.4.49
Finland	MJYZ	A. Wilson, O.B.E.	J. S. Dryman, J. W. Phimister		Currie Line, Ltd.	18.3.48
Fordsdale	GSMW	T. T. Oliver	R. T. Welch, P. H. Carden	H. Knight	Shaw, Savill & Albion Co., Ltd.	25.11.49
Fort Cadotte	MAKS	J. C. Dawson	K. D. A. Lamb, N. MacAlister, D. Calvert	E. S. Pillow	Cunard White Star, Ltd.	11.10.49
Fort Nakasley	MAMM	J. Johnson	A. M. Allan, R. F. Leithead, A. S. Kelly	J. K. McCormack	J. & J. Denholm, Ltd.	16.8.48
Fort Spokane	MXLY	W. T. Fitzgerald, R.D., R.N.R.	R. G. McClymont, D. H. Lee, —. Ogilvy	—. Norton	Cunard White Star Ltd.	30.8.49
Franconia	GBRQ	M. Stewart	P. T. Drake, A. M. Thomson, J. Millington	G. M. Parsons	Cunard White Star, Ltd.	24.6.48
Fresno City	GBYD	W. V. Doughty	A. B. Parkhouse, W. P. Davis, P. C. W. Power	T. H. Owen Ffoulkes	Sir William Reardon Smith & Sons, Ltd.	16.1.50
Geologist	GJMR	A. E. Jackson	S. Richardson, R. H. Douglas, W. Owen	M. H. Whitehead	T. & J. Harrison	6.1.49

Geo. W. McKnight	GCQM	R. A. Swan, O.B.E.	D. Aubrey, F. Eastman, S. M. Garside	J. Everitt	Esso Transportation Co., Ltd.	28.3.49
Georgic	GRLJ	C. S. Williams	G. H. Drinkwater, A. R. M. Graham, T. O. O'Sullivan	A. G. Hill	Cunard White Star, Ltd.	28.9.49
Glaucus	GDYZ	J. Macarthur	R. G. Edwards, F. A. S. Miller, H. Bell	E. Roberts	A. Holt & Co.	31.12.47
Glenartney	GBLG	W. E. Coates	C. Lorimer, J. B. Mothersill	F. Wilson	Glen Line, Ltd.	11.2.49
Glenbank	GKLC	T. Fraser	W. Murphy, D. V. Hoskins	W. Lingbottom	Andrew Weir & Co., Ltd.	7.12.48
Glenorchy	GBLL	C. Houghton	C. C. J. Neaves, H. Bell, C. J. Sawle	E. H. Power	Glen Line, Ltd.	5.12.49
Gloucester	MANK	H. D. Horwood, R.D., Cdr., R.N.R.	L. James, P. Slocombe, P. D. Moran	R. J. Devlin	Federal Steam Nav. Co., Ltd.	20.4.49
Gracia	MANN	J. McInnes	D. M. Allan, G. B. Manson, I. Barbour	M. Grant	Donaldson Bros. & Black, Ltd.	20.8.49
Granford	MQGC	E. C. J. Morgan	J. Grey, A. Kopec, W. Harris		Goulandris Bros., Ltd.	
Haparangi	GJYX	C. R. Pilcher, O.B.E.	J. R. Ramsay, H. P. Lunn, J. T. Peattie, P. B. Bushell	L. P. Rayner	New Zealand Shipping Co., Ltd.	22.7.49
Harmatris	GTWP	A. R. Phelps	G. S. Robinson, A. H. Barber, I. Wagner	L. C. Morris	J. & C. Harrison, Ltd.	17.10.49
Helicina	GKBC	J. F. Rumbellow	I. M. L. McLean, W. P. Abley, M. B. Mactavish, E. C. Hall	A. W. Hutchinson	Anglo Saxon Petroleum Co., Ltd.	22.8.49
Herdsman	GPZX	W. A. Short	J. W. Embleton, K. Cobb	I. Donald	T. & J. Harrison	
Herefordshire	GOFG	H. Davies	H. Knapper, J. W. MacKinlay, F. F. Whiteside	F. W. Greaves	Bibby Bros. & Co.	12.10.49
Highland Brigade	GJKN	H. D. Harper, O.B.E.	D. Buckle, J. Perkins, C. Wightman	W. Gay	Royal Mail Lines, Ltd.	4.3.49
Highland Chieftain	GCTY	H. D. Hooper	M. Wardle, J. P. Martin, G. W. T. Griffiths, H. R. Wright	T. Desborough	Royal Mail Lines, Ltd.	8.1.49
Highland Monarch	GMZF	B. C. Dodds, O.B.E.	N. Lawson, C. B. Lambert, R. L. Collins, R. Tysoe	F. Dunk	Royal Mail Lines, Ltd.	18.8.49
Highland Princess	GFMN	P. Cooper	J. Anderson, W. M. Morton	F. Goodall	Royal Mail Lines, Ltd.	7.10.49
Hilary	GQVM	J. Binns			Booth S.S. Co., Ltd.	
Himalaya	MCDY	H. C. Forsyth, R.D., R.N.R.			P. & O. Steam Navigation Co.	
Hopecrown	GZZG	S. Wilson, O.B.E.	H. G. Strickland, D. Barfoot, J. D. Todd	P. Probert	Stott, Mann & Fleming, Ltd.	14.12.48
Hopepeak	GKGJ	C. R. Laing	J. Pattison, J. Meeks	M. O. Lacey	Stott, Mann & Fleming, Ltd.	10.1.50
Hororata	MANZ	E. H. Hopkins	W. Stevens, P. Jeannes, G. Munson, B. Hewitt	D. E. Hodding	New Zealand Shipping Co., Ltd.	8.11.49
Horsa	MPFJ	D. Dickson	T. J. M. Robertson, J. L. Hume		Currie Line, Ltd.	7.7.48
Hubert	GFNW	G. G. Roberts	T. E. Williams, D.S.C., R.D., Lt. Cdr., R.N.R., K. Grayson, F. Forster	D. Swindon	Booth S.S. Co., Ltd.	23.6.49
Hurunui	GJZF	F. Lougheed	G. Naylor, N. I. Collett, P. R. Moutton	F. Wilman	New Zealand Shipping Co., Ltd.	8.11.49
Inishowen Head	MAOC	G. A. Moore	A. Farrell, C. O'Connor, J. Pigott	F. Murray	G. Heyn & Sons, Ltd.	5.1.49
Inverbank	GKML	A. F. King	G. Cheyne, A. Teale, A. Findlay	S. Dewsnap	Andrew Weir & Co., Ltd.	21.7.49
Jamaica Producer	VPLM	G. E. M. Jenkins	E G. J. Roberts, F. Saunders, P. R. K. Davis	A. C. Webb	Kaye, Son & Co., Ltd.	3.1.50
Jersey City	GIGA	I. Williams	D. L. Beynon, D. Baker, H. M. Keevill	D. R. Davies	Sir William Reardon Smith & Sons, Ltd.	30.9.49
Jessmore	MAOF	G. Brown	P. V. McCullough, K. H. Rowland, E. B. Pratt	S. J. Schuster	Furness, Withy & Co., Ltd.	20.12.49
John Biscoe	GFLF	Cdr. H. Kirkwood, D.S.C., R.N.			Government of the Falkland Isles	
John Holt	GNFD	J. Shaw	P. Bathurst, W. L. Harrison, R. J. Griffiths	P. A. Senior	John Holt & Co. (Liverpool), Ltd.	12.10.49
Kaipaki	GQGJ	T. Fenwick	J. R. Suffren, F. Le Messurier	F. Matthews	Trinder, Anderson & Co.	21.8.48
Kaipara	GZPY	G. P. Parkinson, O.B.E.	D. M. Steven, N. Stirzaker, A. E. Carter	R. M. Evans	Trinder, Anderson & Co.	16.12.49
Kaituna	GQGG	R. F. Hillings	C. F. Turner, J. Milne, J. Newing	T. Herbert	Trinder, Anderson & Co.	4.1.49
Kano Palm	GYRM	H. Coffey, R.D., R.N.R.	T. W. C. Rylance, J. Gall, R. B. Dales	W. G. Fitzgerald	United Africa Co., Ltd.	30.6.49
Kenilworth Castle	MQLP	L. H. Farrow	J. K. Mumford, J. H. Drummond, I. Bigham	C. Robinson	Union-Castle Mail S.S. Co., Ltd.	24.2.49
Kent	GPDC	N. A. Thomas	B. Linklater, A. Stalker, S. Twyford	C. Jones	Federal Steam Navigation Co., Ltd.	10.12.49
King Robert	MAON	G. Craze	W. Keith, G. Griffiths, P. Kidd	W. Fielding	Dodd, Thomson & Co., Ltd.	10.10.47
King William	GNVF	E. B. Driver	J. C. Davis, G. F. Hogg, A. J. Moore	P. Kelly	Dodd, Thomson & Co., Ltd.	8.11.49

Name of Vessel	Call Sign	Captain	Observing Officers	Senior Radio Officer	Owners/Managers	Last Return Received
Kohistan	GSFZ	C. M. Henderson	W. G. Smith, A. L. Rigden, P. H. Alexander	P. Goss	F. C. Strick & Co., Ltd.	24.8.49
Laguna	GJKC	S. E. Ayland	R. H. Scaiff, W. Johnston, L. J. Nurse	K. W. Baddeley	Pacific Steam Navigation Co.	20.9.49
Lambrook	MOAS	H. F. McInnes	J. Orr, A. Sillars, R. F. Arnold	J. W. Fulton	Galbraith, Pembroke & Co., Ltd.	1.6.49
Lanarkshire	GCTC	C. E. O'Byrne	A. Mair, M. T. Morton, W. W. S. Arnott	J. B. Allan	Turnbull, Martin & Co., Ltd.	12.7.49
Lancashire	GLZC	E. W. Jeffries	W. H. Malley, J. C. Priest, B. MacKinnon	A. Jones	Bibby Bros. & Co.	16.11.49
Lassell	GFND	D. Roberts	S. Dickenson, J. Bicknell, P. V. des Landes	N. Moore	Lamport & Holt Line, Ltd.	1.6.49
Latia	GLCF	R. S. Walker	A. P. S. Jackson, N. Morganti, R. J. Stanley	J. Brownlee	Anglo Saxon Petroleum Co., Ltd.	12.10.49
Leicester	GBTG	S. W. Andrews	H. Owen, J. Sutherland, C. Single, T. Rowland	E. Howarth	Federal Steam Nav. Co., Ltd.	8.11.49
Levernbank	GLPZ	D. Gillies	C. R. Eaddy, C. G. Watterson, J. M. Whitridge, L. Anderson	W. C. Doyle	Andrew Weir & Co., Ltd. T. & J. Harrison	12.7.49
Linguist	GQBC	A. H. Frew				
Livorno	GPWF	E. S. Green	F. Methan, J. Williams, J. Beer	K. W. Baddeley	Ellerman's Wilson Line, Ltd.	1.6.48
Llangibby Castle	GPLV	B. W. B. Lloyd	D. Leitch	J. Eager	Union-Castle Mail S.S. Co., Ltd.	16.11.49
Lloydcrest	MAOY	L. Barwell	C. Lines, D. W. Verniers, A. H. Benson	M. Riley	Crest Shipping Co., Ltd.	
Lobos	GDXL	P. Ray	J. H. Allenby, F. Hutchings, R. Pass	E. Fisher	Pacific Steam Navigation Co.	25.2.49
Loch Avon	GMZT	W. W. Lowe	G. E. Leech, D.S.C., W. M. Morton, J. V. Bradbury, J. M. Ashworth	M. R. Littlejohn	Royal Mail Lines, Ltd.	18.3.48
Loch Garth	GMZY	R. N. Fletcher	E. A. E. Littlewood, J. N. Kavanagh, A. Hanily	D. Morgan	Royal Mail Lines, Ltd.	17.11.49
Loch Ryan	MAOZ	H. H. Treweeks	R. C. Hunnisett, V. Charles, B. Stark, C. Cowley	R. Turner	Royal Mail Lines, Ltd.	22.11.49
Lord Gladstone	MAPA	P. S. Kenning	A. H. Treikelder, J. Javezak, J. S. Armstrong	J. Saidler	Ships Finance & Management Co., Ltd.	4.3.49
Lord Glentoran	GRMK	W. J. Leinster	A. F. James, C. O'Connor, S. Thompson	J. J. Sheridan	G. Heyn & Sons, Ltd.	21.12.49
Lord O'Neill	GRLZ	R. A. Ferguson	R. M. Hall, R. Harper, J. Blaney	C. A. Murphy	G. Heyn & Sons, Ltd.	20.4.49
Loriga	GCLM	J. E. Evans, D.S.C., R.D., Capt., R.N.R.	A. S. Maclean, H. Riding, R.D., R.N.R., R. O. Walters	J. S. Wilson	Pacific Steam Nav. Co.	18.3.49
Losada	GDXM	P. L. Hockey	F. J. Leicester, W. Jenkins, J. G. Galston	E. O'Neill	Pacific Steam Nav. Co.	29.7.49
Luminous	MAPB	S. Weatherston	A. W. Banks, R. M. Chalmers	D. Whiteling	H. E. Moss & Co.	20.6.49
Machaon	GDPS	H. S. Wood	—. Collins, —. Sawle, E. Hill, —. Naylor	W. S. Ogilvie	A. Holt & Co.	30.12.49
Macharda	GKKF	R. A. Penston	—. Jackson, L. J. S. Saxty, —. Kirkham, —. Ralli	—. Fisher	T. & J. Brocklebank, Ltd.	14.12.48
Magdapur	GBJX	H. E. MacGregor	N. H. Embleton, G. W. Sinclair, R. J. Ryding	E. Halton	T. & J. Brocklebank, Ltd.	10.3.49
Mahanada	GOFM	J. W. B. Robertson, R.D., R.N.R.	J. Brand, J. C. Long, P. Greenall, G. P. Hurns	T. Williams	T. & J. Brocklebank, Ltd.	4.1.49
Mahia	GNZV	G. Campbell	N. E. Wood, H. P. M. Lawrence, D. A. C. Adams	J. Nolan	Shaw, Savill & Albion Co., Ltd.	12.7.49
Mahout	GDZN	H. F. Scoins	D. L. Campbell, E. G. Anderson, H. L. Burn	C. W. Jacobs	T. & J. Brocklebank, Ltd. T. & J. Brocklebank, Ltd.	31.12.49
Mahseer	GZSV	L. T. Owen, O.B.E.				
Mahsud	GSCP	L. E. Jeans	J. W. Ross, J. H. Moore, E. McAully	B. Pinn	T. & J. Brocklebank, Ltd.	6.9.49
Maihar	GSCL	J. R. Paisby	J. P. Pembridge, M. H. Taylor, D. L. des Landes	A. G. Lea	T. & J. Brocklebank, Ltd.	5.5.49

Makalla	GOFN	T. E. Eddy	C. S. W. Gray, E. Watkins, R. F. Holland	G. Caddy	T. & J. Brocklebank, Ltd.	12.7.49
Malakand	GOFP	J. Owen	J. P. Jackson, A. B. Davies, G. Parı Huws	A. N. Orum	T. & J. Brocklebank, Ltd.	28.9.49
Malancha	GZRD	S. Broughton	J. Clarke, J. R. Kemp, D. J. Evans	B. J. Smith, M.B.E.	T. & J. Brocklebank, Ltd.	9.9.49
Malayan Prince	GFVW	J. D. Fraser	E. Roberts, I. J. Sladen, K. Slapp	G. Close	Furness, Withy & Co., Ltd.	18.1.49
Malmesbury	MAQE	W. McMellin	P. J. Leech, A. Jewers	W. Humphries	Houlder Bros. & Co., Ltd.	25.4.49
Malmo	GQCN	J. W. Calvert			Ellerman's Wilson Line, Ltd.	
Maloja	GFBD	E. J. Parry	R. M. Sinclair, R. N. Firth, J. C. Jenkins	A. Macbeth	P. & O. Steam Navigation Co.	16.1.50
Manchester City	GBBP	F. L. Osborne	W. Hine, J. A. McCarren, J. Rushworth, L. Pound	A. J. S. Broadbent	Manchester Liners, Ltd.	29.7.49
Manchester Commerce	GKMY	H. Hancock	W. E. Quick, J. E. Askew, R. Wadsworth	A. R. Evans	Manchester Liners, Ltd.	8.6.48
Manchester Division	GBYR	E. W. Espley	M. F. Robinson, C. Cuird, T. H. Lynn	P. Cummins	Manchester Liners, Ltd.	2.2.48
Manchester Port	GYNF	F. Downing	J. E. Jones, J. S. Dalgarno, T. Field, A. H. Swan	P. B. McNab	Manchester Liners, Ltd.	10.1.50
Manchester Progress	GPGD	W. H. Downing	F. Lewis, L. Taylor, C. Marchant	W. C. Critchley	Manchester Liners, Ltd.	5.1.49
Manchester Regiment	GBRD	F. D. Struss, O.B.E., D.S.C.	W. R. McLaren, J. E. Askew, F. Jones	A. Reid	Manchester Liners, Ltd.	19.10.49
Manchester Shipper	MAPC	J. Barclay	F. Lewis, D. Heaton, T. H. Lynn	E. Ambler	Manchester Liners, Ltd.	14.1.47
Manchester Trader	GMWG	E. W. Raper	W. E. Oliver, P. N. Fielding, A. C. Caird, N. Cockshoot	A. C. Gavin	Manchester Liners, Ltd.	12.1.49
Mandasor	GBNY	R. Humble	D. A. Keller, A. W. Wiltshire, J. D. Gutherie	G. W. Hazel	T. & J. Brocklebank, Ltd.	8.11.49
Marengo	GLFW	F. Ellison	E. Edwards, R. Tutty, C. Main	G. Camm	Ellerman's Wilson Line, Ltd.	12.8.49
Margay	GFYQ	E. A. Prentice	J. E. Thompson, A. Skelton, J. B. Ricketts	—. McDonald	Kaye, Son & Co., Ltd.	9.11.49
Marietta Dal	GBQJ	J. G. F. Brighty	L. D. Forster, W. Huntley, W. Rothwell	A. Hadden	Dalhousie Steam & Motor Ship Co., Ltd.	21.12.49
Markhor	GTFZ	J. B. Newman	I. A. Maclaren, J. Ritchie, —. Woodward	D. Owen	T. & J. Brocklebank, Ltd.	7.2.49
Marna	MLPK	G. R. Nelson	R. J. Sinclair, W. Allen		Chr. Salvesen & Co.	27.8.48
Marquita	GQVY	F. C. Jennings	J. Cush, T. Liddle, D. Parker	K. C. Wright	Kaye, Son & Co., Ltd.	4.1.49
Marsdale	GBKB	M. Ferguson	H. Jones, J. Tiere, L. Marsell		Kaye, Son & Co., Ltd.	
Martand	GTGG	T. Fox-Lloyd	E. L. Jones, P. A. Litherland, W. H. Clifford-Hicks	D. H. Butterworth	T. & J. Brocklebank, Ltd.	15.1.49
Martita	GNQT	H. Bunn	M. G. Stevens, H. R. Watson, D. Johnston	D. Diver	Kaye, Son & Co., Ltd.	21.12.49
Mataroa	GCSV	R. G. James, R.D., Capt., R.N.R.	H. G. Moss, P. M. Williams, R. McL. Munro	L. Boyce	Shaw, Savill & Albion Co., Ltd.	20.9.49
Matheran	GOFQ	A. B. Bannatyne, O.B.E.	H. Simpson, J. A. Miller, R. M. Lucas	P. Neeson	T. & J. Brocklebank, Ltd.	2.11.49
Matina	GSZX	H. Roberts, O.B.E.	—. Crane, B. Hodges, H. G. Cresswell	D. Knights	Elders & Fyffes, Ltd.	30.11.49
Mauretania	GTTM	C. Ivan Thompson	G. Carter, J. Ward, I. Clark, H. Gurnell	F. Clarke	Cunard White Star, Ltd.	12.12.49
Media	GSWR	J. Quayle, R.D., R.N.R.	J. A. B. Munro, R. A. Elder, P. King, T. D. Ridley	W. M. MacArdle, M.B.E.	Cunard White Star, Ltd.	25.11.49
Melbourne Star	GDFZ	F. N. Riley, D.S.O.	T. S. McGregor, J. Allan, G. Hayward	J. Clarke	Blue Star Line, Ltd.	27.7.49
Millais	MAPH	A. R. Bibby, O.B.E.	J. Edgar, D. S. Leicester, A. B. Baines	J. Williams	Lamport & Holt Line, Ltd.	14.10.49
Mirror	GDFL	S. A. Gammon	R. E. Small, P. B. Henderson, C. E. Burrill	J. Crouch	Cable & Wireless, Ltd.	5.12.47
Monarch	GBDF	J. P. F. Betson	R. M. Tuckwell, R. H. Hardy, E. J. Evans	D. Rendall	General Post Office	5.12.49
Mooltan	GFBC	C. E. Pollit	G. Buckley, J. W. Owen, P. Jefferies, M. Phelps	G. P. Carey	P. & O. Steam Navigation Co.	19.8.49
Moveria	GKYW	J. S. McMillan	C. E. Waddel, A. T. Johnston, R. S. Hopkins	H. D. Robinson	Donaldson Bros. & Black, Ltd.	12.2.49
Myrtlebank	GLQB	F. Hale	G. G. Hodgson, J. T. Duncan, F. J. Adamson	N. Kehoe	Andrew Weir & Co., Ltd.	12.7.49
Napier Star	MAPN	C. Horton, D.S.C.	R. Prince, M. Rideout, J. Reeve	R. Mills	Blue Star Line, Ltd.	12.8.49
Naticina	GIGH	F. Mansfield	P. Kendall, M. Goddard, L. Stephens	J. E. Conway	Anglo-Saxon Petroleum Co., Ltd.	4.1.49
Nestor	GPYX	E. W. Powell, M.B.E.	E. L. Stubbings, I. S. Todd, B. C. Pays	L. Booth	A. Holt & Co.	16.11.49
Newfoundland	GNMC	C. H. Kenyon	J. B. Stewart, J. Sheffield, D. Beighton	T. Cahill	Furness, Withy & Co., Ltd.	19.1.50

Name of Vessel	Call Sign	Captain	Observing Officers	Senior Radio Officer	Owners/Managers	Last Return Received
Norfolk	GJLV	A. I. Robertson, R.D., Capt., R.N.R.	S. G. Robinson, A. B. Moss, J. G. Glover	J. Heath	Federal Steam Nav. Co., Ltd.	20.8.49
Northumberland	GBSJ	A. E. Williams	J. Cubitt, C. Masson, J. Witchell	J. Charter	Federal Steam Nav. Co., Ltd.	7.12.48
Norwegian	GDMC	C. Low	J. Downie, J. Hunter, J. Clarke	J. Lennox	Donaldson Bros. & Black, Ltd.	
Nova Scotia	GNNK	J. E. Wilson, O.B.E.	J. D. P. Williamson, R. Heys, D. Taylor	W. C. Brock	Furness Withy & Co., Ltd.	31.10.49
Novelist	GMLG	T. E. Steel	D. O. Percy, G. B. Roberts, G. K. Watson, T. Maddox	J. Timmons	T. & J. Harrison	10.1.50
Orari	GJKX	F. Lougheed	M. D. Holden, J. A. Edmondson, R. S. Hales	J. W. Bundlewood	New Zealand Shipping Co., Ltd.	19.10.49
Orbita	GLTQ	J. Sutherland	E. G. Shephard, G. E. Mitchell, P. Whelbourn	J. Stone	Pacific Steam Navigation Co.	16.11.49
Orcades	MABA	C. Fox, C.B.E.	—. Hardy, —. Kingswood, —. Finch, J. L. Radcliffe	N. A. Boon	Orient Steam Navigation Co., Ltd.	24.9.49
Orduna	GLTS	J. Williams	T. Wilcockson, A. L. Dixon, J. Owen	J. Clarke	Pacific Steam Navigation Co.	12.12.49
Orion	GYKL	N. A. Whinfield	D. P. Blois, A. Murray, D. K. Kinloch	T. Shannon	Orient Steam Navigation Co., Ltd.	14.11.49
Ormonde	GLYC	—. Vesty	C. S. Thomas, R.D., Lt. Cdr., R.N.R., L. C. Kingswood, P. J. Collier	R. Oakley	Orient Steam Navigation Co., Ltd.	7.12.48
Orontes	GBXM	I. E. G. Goldsworthy, R.D., R.N.R.	R. F. Underwood, F. W. Woolley, G. McGowan	F. Murphy	Orient Steam Navigation Co., Ltd.	4.1.49
Otranto	GFKV	—. Bernand	J. W. Terry, C. S. Thomas, —. Francis, R. L. Clark	C. J. Seaton	Orient Steam Navigation Co., Ltd.	16.1.50
Pacific Exporter	GBJC	W. F. Swann	D. MacDonald, M. J. Brown, A. Pringle	A. Cary	Furness, Withy & Co., Ltd.	23.6.49
Pacific Fortune	GBFM	E. O. Evans			Furness, Withy & Co., Ltd.	
Pacific Importer	GDKV	B. M. Collard	G. Cook, A. H. Linden, E. H. Gregson	V. Ash	Furness, Withy & Co., Ltd.	10.1.50
Pacific Liberty	GDFQ	N. Conbrough			Furness, Withy & Co., Ltd.	
Pacific Nomad	GCRZ	W. Hutchinson	J. Sims, L. M. Morgan, R. A. Mastin	B. Coghlan	Furness, Withy & Co., Ltd.	5.12.49
Pacific Shipper	GKBV	E. V. Richards	B. A. Newcomb, P. S. Taylor, E. H. Gregson	A. G. Williams	Furness, Withy & Co., Ltd.	20.7.49
Pacific Stronghold	GNSQ	F. H. Perry	J. Clarke, D. R. Gibson, —. Keene	S. Vincent	Furness, Withy & Co., Ltd.	21.1.49
Pacific Unity	GUAN	H. S. Reveley			Furness, Withy & Co., Ltd.	
Palacio	GNJW	J. P. Harris	L. P. Sheppard, W. H. Davis, E. Pepper	J. A. Robinson	MacAndrews & Co., Ltd.	7.12.49
Palana	MMBF	F. R. Spurr	M. A. Frenfield, G. T. Page, J. A. Lefevre	H. Olding	P. & O. Steam Navigation Co., Ltd.	28.6.49
Palomares	GJGN	D. L. Thomas, M.B.E.	—. Faulkner, J. Szhage, R. Ludgate, C. Long	L. Phillips	MacAndrews & Co., Ltd.	19.1.50
Pampas	GCDL	R. C. S. Woolley	K. E. McClure, C. W. Williams, K. R. Jones	H. Booth	Royal Mail Lines, Ltd.	12.8.49
Papanui	GDJW	B. Evans	I. Y. Batley, T. A. Bennett		New Zealand Shipping Co., Ltd.	20.7.49
Paparoa	GBCZ	D. H. Chadwick	R. Kinloch, M. Byrd, T. Train	H. Hare	New Zealand Shipping Co., Ltd.	10.1.50
Paraguay	MAQS	H. V. Todd	G. A. Gibbons, D. Davies, M. Blackman	P. Goulden	Royal Mail Lines, Ltd.	21.1.49
Pardo	GMNZ	T. Powell	C. G. M. Smith, G. Dudley	H. J. Coates	Royal Mail Lines, Ltd.	20.4.49
Parima	GCLQ	H. E. Sang	J. T. Jones, R. C. Hunnisett, J. M. Barber	N. H. Crocker	Royal Mail Lines, Ltd.	21.3.49
Paringa	MMBD	E. F. Ferraby	P. C. Reed, R. Elenor, A. W. Dallas	B. S. Magennis	P. & O. Steam Navigation Co.	12.2.49
Parthia	GSWQ	C. B. Osborne	R. Arnott, P. S. Taylor, J. K. Finlay	A. O'Sullivan	Cunard White Star, Ltd.	16.11.49
Pegu	GFGP	H. V. Poole	J. Walker-Brown, I. S. MacColl, A. Crozier, T. A. Hood	R. Wilson	P. Henderson & Co.	23.6.49
Perim	GCGB	J. M. Peter	P. J. Jackson, P. Hewitt, R. T. Neve	F. Groves	P. & O. Steam Navigation Co.	7.10.49
Perthshire	GYWK	A. J. Hogg	J. Browne, C. Stonehouse, D. G. Geddes, M. J. Skillington	F. Rayner	Turnbull, Martin & Co., Ltd.	8.6.49

Philomel	GYPV	H. M. Selmar	D. C. Diggins, P. J. Slater, W. Davies, P. Beech	A. Laurie	General Steam Navigation Co., Ltd.	14.11.49
Philosopher	MAQV	H. Coates			T. & J. Harrison	
Pilcomayo	GBZX	T. Davies	D. P. Warren, P. Anthony, J. Egan	P. Hampson	Royal Mail Lines, Ltd.	4.1.49
Pipiriki	GDRQ	R. G. Rees	P. M. Busby, D. G. Seward, A. W. Finch	L. P. Sayer	New Zealand Shipping Co., Ltd.	1.6.49
Polar Maid	MAQX	J. T. Leask	E. D. Smith, W. Wilson	P. Curzon	Chr. Salvesen & Co.	10.1.50
Port Auckland	GWRB	W. G. Enright, O.B.E., Cdr., R.N.R.			Port Line, Ltd.	
Port Brisbane	GWRC	—. Steele	G. K. Morris, J. F. Barratt, W. M. Crossman	J. Griffiths	Port Line, Ltd.	18.8.49
Port Chalmers	GWQR	E. T. W. Lawrey	P. A. N. Thomas, J. H. Stewart, V. A. Hunt	E. G. Gunner	Port Line, Ltd.	24.8.49
Port Hobart	GKGC	T. F. Kippins, O.B.E., D.S.C.	A. J. Braund, J. D. Aitchison, R. G. Gilling	B. Morley-Evans	Port Line, Ltd.	16.12.48
Port Jackson	GZKR	H. Pinkney, D.S.O., M.B.E.	R. V. McKee, D. M. MacKeith, D. Sinclair	R. C. Crompton	Port Line, Ltd.	10.12.49
Port Lincoln	GFZK	L. Copeland	G. G. Carter, G. Manley, M. W. Raggitt	P. T. McKeon	Port Line, Ltd.	28.6.49
Port Macquarie	MAQY	E. E. Roswell	R. M. Liley, F. Lascelles, H. A. Sproul-Cran	R. Robertson	Port Line, Ltd.	23.2.49
Port Phillip	MAQZ	J. G. Lewis, O.B.E.	J. Rose, H. Thompson, H. R. Long	B. McGovern	Port Line, Ltd.	16.12.49
Port Pirie	GLVQ	H. Steele	A. McClouenan, R. C. Matthews, J. T. Martyn	W. Miller	Port Line, Ltd.	25.1.49
Port Wellington	GDNJ	E. J. Syvret	J. M. Bedwell, D. Sinclair, P. L. Hollings, G. Blundell	J. S. Macpherson	Port Line, Ltd.	27.7.49
Port Wyndham	GYCW	E. E. Roswell	P. R. Lewis, M. Field, C. M. Watkins	J. N. Coutts	Port Line, Ltd.	8.11.49
Potaro	GNLJ	G. H. Taggart	R. D. Jones, R. R. Thompson, J. T. Price	T. J. Berry	Royal Mail Lines, Ltd.	16.11.49
Pretoria Castle	GOAE	J. C. Brown, C.B.E., R.D., Cmde., R.N.R.	D. N. Kernick, S. Kitching, J. Snelgar	H. Oliver, M.B.E.	Union-Castle Mail S.S. Co., Ltd.	23.1.50
Rakaia	GFGW	J. Oxnard	B. Crust, T. Wadie, A. Sims		New Zealand Shipping Co., Ltd.	30.9.49
Ramore Head	MAXX	E. W. Black			G. Heyn & Sons, Ltd.	
Ranchi	GLKW	A. G. Jenkins	E. R. Rose, J. Clayton, P. W. Holmes	R. V. Gregory	P. & O. Steam Nav. Co.	18.1.49
Rangitata	GSZN	G. Kinnell, O.B.E.	M. Drake, N. Etherton, C. Single	P. J. Smyth	New Zealand Shipping Co., Ltd.	3 11.48
Rangitiki	GSXW	P. B. Clarke, M.V.O., O.B.E., D.S.C.	M. J. Blake, R. E. Baker, W. M. Bell	S. Peeling	New Zealand Shipping Co., Ltd.	28.10.49
Rangitoto	GLMV	A. E. Lettington, D.F.C.			New Zealand Shipping Co., Ltd.	
Recorder	GTPV	C. C. Heaton	P. A. Leighton, P. B. Dilleigh	F. Foye	T. & J. Harrison	3.1.50
Regent Hawk	GMND	J. Ward	T. Farrar, G. Arthur, M. D. Keogh	R. W. Jones	Regent Petroleum Tankship Co., Ltd.	21.9.49
Reina Del Pacifico	GMPS	W. A. Hearle	J. A. Greenwood, J. B. Olsson, W. J. Campbell	J. Butler	Pacific Steam Navigation Co.	12.7.49
Repton	GPFL	D. Cownie	D. M. Muir, F. L. James, G. R. Watts	W. Keogh	Galbraith, Pembroke & Co., Ltd.	23.6.49
Rhodesia Star	GUAX	C. H. Watson	R. H. Jones, P. J. Ellett, A. S. Frier, R. B. Escreet	R. C. Wilde	Lamport & Holt Line, Ltd.	17.6.49
Rialto	GBLV	G. Hodgson			Ellerman's Wilson Line, Ltd.	
Richmond Castle	GCSP	J. A. Sowden	C. Arenz, C. J. Willis	P. Sharpe	Union-Castle Mail S.S. Co., Ltd.	12.9.49
Richmond Hill	GMKJ	J. P. Allen	S. Sloan, K. D. William, L. Gellee	J. Scott	Counties Ship Management Co., Ltd.	6.12.48
Rimutaka	GFBJ	T. L. Maltby	D. L. Willmott, J. M. Heeley, F. I. Christall	C. L. Lambe	P. & O. Steam Navigation Co.	12.10.49
Rippingham Grange	G1GP	R. Owen, O.B.E.	H. Butler, A. J. Bulley, A. G. Bray, A. H. Fawcett	J. G. Mitchell	Houlder Bros. & Co., Ltd.	29.8.49
Rochester Castle	GZQF	J. M. Rayner, R.D., Cdr., R.N.R.	G. D. Fowler, R.D., Lt. Cdr., R.N.R., J. V. H. Drummond, D. Kerr	G. Mein	Union-Castle Mail S.S. Co., Ltd.	25.4.49
Roslin Castle	GYJZ	H. L. Holland	L. McEwan, G. E. Smith	H. E. Robinson	Union-Castle Mail S.S. Co., Ltd.	17.10.49

Name of Vessel	Call Sign	Captain	Observing Officers	Senior Radio Officer	Owners/Managers	Last Return Received
Rowallan Castle	GDFT	R. A. D. Cambridge, D.S.C., R.D., Cdr., R.N.R.	H. Walden, M. W. Williams, —. Howson	T. M. K. Knowles	Union-Castle Mail S.S. Co., Ltd.	9.11.49
Roxburgh Castle	GBGS	J. D. B. Fisher	—. Charnley, —. Eckford, M. Kenshole	L. W. Bettinson	Union-Castle Mail S.S. Co., Ltd.	20.7.49
Royal Star	MARJ	G. Aldridge	A. Borthwick, B. Edgington, P. Hunt	M. Cahill	Blue Star Line, Ltd.	23.11.49
Rubystone	MARK	E. J. Griffiths			Navigation & Coal Trade Co., Ltd.	
Runnymede Park	GNMZ	T. Stroughair	L. Haddock		Baltic Shipping Co., Ltd.	
Rutland	GTCP	W. Thom	J. A. Williamson	J. Macfarlane	Currie Line, Ltd.	8.1.47
Ruysdael	MAQP	D. E. Norie	A. Matheson, J. T. Hibbert	H. Holdridge	Bolton S.S. Co., Ltd.	
Sacramento	GKCN	J. Robinson, M.B.E.	H. Edwards, C. W. Fox, J. Ryley	W. Parratt	Ellerman's Wilson Line, Ltd.	18.3.49
St. Apollo	GBBZ	J. H. Ellis, D.S.C.			T. Hamling & Co., Ltd.	
St. Crispin	MBSW	A. E. Hall	D. L. Verity	D. L. Verity	B. A. Parkes	10.12.47
St. Ronan	GBFJ	A. Robinson			T. Hamling & Co., Ltd.	
Salacia	GZRN	T. S. Graham	G. M. Clark, J. Hunter, I. MacGregor	W. Docherty	Donaldson Bros. & Black, Ltd.	16.1.50
Salamanca	GLSG	D. W. Hutchison	J. N. Owen, W. P. Duguid	T. J. Kirkpatrick	Pacific Steam Navigation Co.	10.1.50
Salaverry	GBLQ	J. D. Richards	P. D. O'Driscoll, J. Peters, R. Riley, K. Williams, G. A. Duffy	J. Slater	Pacific Steam Navigation Co.	11.1.50
Salinas	GLLK	A. G. Litherland	A. Powell, R. Scaiff, R. R. Williams	F. J. Fitzgerald	Pacific Steam Navigation Co.	27.6.49
Samanco	MARQ	A. Lyall	D. I. Jones, W. B. Holmes, G. D. Jeffery	A. Hatfield	Pacific Stean Navigation Co.	20.4.49
San Adolfo	GYKK	L. Mays	T. Magee, D. P. Carroll, D. Frazer	B. A. Palin	Eagle Oil & Shipping Co., Ltd.	16.11.49
San Cirilo	GZMR	M. A. Connell, M.B.E.	T. B. Wright, R. G. Scarey, D. A. Ward	D. W. Powell	Eagle Oil & Shipping Co., Ltd.	28.3.49
San Felix	GFJZ	C. Summers	A. F. Walker, J. Dixon, B. T. Orange	W. L. Radcliffe	Eagle Oil & Shipping Co., Ltd.	12.9 49
San Velino	GCNY	M. A. Connell, O.B.E.	J. J. Greener, A. T. Cross, A. G. Stephenson, R. V. Hartley	H. B. Hurst	Eagle Oil & Shipping Co., Ltd.	25.11.49
San Veronico	MASQ	J. Thomson, O.B.E.	M. Holdron, D. Kennedy, J. Thomas	J. Timmons	Eagle Oil & Shipping Co., Ltd.	14.10.49
San Vulfrano	MASR	F. R. H. Atkinson	W. F. Hunt, J. D. Nash, P. Johnson	B. Kimble	Eagle Oil & Shipping Co., Ltd.	3.5.49
Santander	GBNR	T. J. Naylor	K. Thomas, O. A. Baker, J. T. Bruce	C. Murray	Pacific Steam Navigation Co.	28.11.49
Sarmiento	MARW	G. H. Rice	T. Hiatt, F. Nuttall, T. A. Ireland	N. Roberts	Pacific Steam Navigation Co.	5.3.49
Saxon Star	MARX	J. D. W. Davies	H. Tompsett, D. Gaffney, G. Irving	J. D. Fulton	Blue Star Line, Ltd.	10.1.50
Scholar	GDCC	D. Wolstenholme	D. A. Hancock, R. E. Harvey, J. M. Doran	C. Townley	T. & J. Harrison	30.12.49
Selector	MARZ	W. H. Slaughter	W. McInnes, W. Owens, O. T. Jones	J. Clerk	T. & J. Harrison	3.3.49
Settler	GTTX	R. F. Phillips	W. Baker, W. D. Aitken, R. Crenall	A. Brett	T. & J. Harrison	12.7.49
Silverbriar	GDWM	W. N. Tulloch	J. H. Tomlinson, M. Rawson-Duke, D. Paget-Clarke	T. Coughlan	Silver Line, Ltd.	20.4.49
Silverguava	GMVK	W. G. Cole	N. W. Rothwell, D. M. Lamont, N. C. Jones	R. Burrow	Silver Line, Ltd.	10.11.48
Silverplane	MABL	R. H. Woodrow	P. C. Palmer, K. Allen, G. Stobo	—. Arthurs	Silver Line, Ltd.	19.8.49
Silversandal	GSFQ	J. H. Leask	E. Reed, A. R. Moore, M. J. S. Beaumont, M. A. A. Oldakoski	A. B. King	Silver Line, Ltd.	11.10.49
Silveroak	GCQR	W. N. Tulloch	F. E. Godley, K. A. Wise, P. R. Miller	D. Will	Silver Line, Ltd.	8.9.48
Silverteak	GSFR	E. Palmer	K. Allen, H. Rose, M. Bingham	J. Thomas	Silver Line, Ltd.	30.12.49
Silverwalnut	GSFT	E. L. Tilmouth	W. J. Ross, J. B. de Wet, F. A. Ferguson	J. Hands	Silver Line, Ltd.	28.3.49
Sneaton	GDBS	W. Armstrong	W. Locker, N. Newton, E. Wilson	A. D. Carter	Headlam & Son	1.6.49
Socotra	MASC	J. C. Last, Cdr., R.N.R.	D. A. Hansing, J. L. Dunkley, R. B. Nowell, P. W. F. Holmes	H. J. Camp	P. & O. Steam Navigation Co.	20.7.49
Somerset	GJMN	P. S. Calcutt	C. Masson, C. Jackson, H. S. Collins	P. Broome	Federal Steam Navigation Co., Ltd.	16.1.50
Southern Atlantic	GBLY	M. G. Oliver	D. Lawson		Chr. Salvesen & Co.	
Southern Collins	MASE	D. Hunter	D. Falconer, D. Moar, G. Reid	G. Ballantine	Chr. Salvesen & Co.	31.3.49
Southern Garden	MASF	W. J. Swanson	W. Scott, R. Marshall, E. G. Sutton	W. J. Tullock	Chr. Salvesen & Co.	2.6.49
Southern Harvester	GFZJ	K. Granöe	T. J. Morgan, J. T. Petrie	J. Spratt	Chr. Salvesen & Co.	8.6.48

Southern Opal	MASG	A. F. Baikie	D. Watt, T. Fletcher, J. Budge	C H. Houston	Chr. Salvesen & Co.	5.5.49
Southern Venturer	GNNM	H. Myhoe	A. W. Aitken		Chr. Salvesen & Co.	7.6.49
Sovac	GDDV	H. Anthony	J. Miller, R. Jarrett, L. Ash	E. Hobson	Vacuum Oil Co., Ltd.	25.10.49
Speaker	GCGT	C. C. Heaton	R. J. Abbott		T. & J. Harrison	
Specialist	GCYF	L. F. Harriman	J. Beam, A. F. Perry	J. Glover	T. & J. Harrison	10.11.48
Springfjord	GQKQ	T. R. Mackle	J. Reid	A. Guy	Springwell Shipping Co., Ltd.	18.1.49
Stancourt	GKCP	J. McAlpine	J. Mann, C. G. Smeaton, P. B. Webster	M. Kavanagh	J. A. Billmeir & Co., Ltd.	10.12.49
Stanhall	GCQZ	H. V. Wightman	P. J. Macpherson, L. A. Bowen-West	O. R. Wilcox	J. A. Billmeir & Co., Ltd.	5.5.49
Stirling Castle	GYPX	W. A. Place, O.B.E.	W. Fletcher, —. Sincock, —. Rooker	P. P. Williams	Union-Castle Mail S.S. Co., Ltd.	28.9.49
Stirlingshire	GCQD	J. McCrone	A. S. Palethorpe-May, G. A. Winter, R. T. Escolme	N. J. Braddon	Turnbull, Martin & Co., Ltd.	20.6.49
Strathaird	GRSX	H. S. Allen, R.D., Cmde., R.N.R.	M. H. D'aeth, P. Gudgeon, J. Owen	F. E. Ash	P. & O. Steam Navigation Co.	10.11.48
Stratheden	GDGT	S. W. S. Dickson	H. Toon, D. G. Daniel, D. C. Guthrie	H. S. Horn	P. & O. Steam Navigation Co.	19.1.48
Strathmore	GYMS	E. Lee	J. B. Wilson		P. & O. Steam Navigation Co.	
Strathnaver	GRPZ	J. C. Mellerie			P. & O. Steam Navigation Co.	
Struan	MASJ	M. Polson	J. Raffan, J. Parry, P. Tweedie	W. Hays	Chr. Salvesen & Co.	8.11.49
Suffolk	GQQS	F. Pover	J. Laidlow, N. A. Dennis, D. Nicholson	J. Turnham	Federal Steam Nav. Co., Ltd.	20.4.49
Suncrest	GNWW	T. G. Barwell	T. L. Ison, J. E. Collins, P. Tate	J. McMahon	Crest Shipping Co., Ltd.	6.2.48
Sutherland	GBYG	R. W. Nicolson	E. F. Smith, C. R. Madsen, G. Lewis	I. R. Lloyd	B. J. Sutherland & Co., Ltd.	3.1.50
Swainby	GPFS	J. E. Roddam	K. Jackson, A. C. Bolton, W. M. Fallon	D. Ford	Sir R. Ropner & Co., Ltd.	24.2.49
Sydney Star	MKSM	T. F. McDonald, O.B.E.	A. Kennedy, J. C. Davies, F. Bell, J. C. Mackintosh	J. McConnell	Blue Star Line, Ltd.	12.7.49
Talca	GCDT	G. B. Wardale	G. Patterson, R. Grice, H. Howes	W. Reich	Pacific Steam Navigation Co.	10.12.49
Tamaroa	GFWX	W. Thompson	S. P. Oliver, —. Lane, J. E. Hurst, R. Ling	D. MacRae	Shaw, Savill & Albion Co., Ltd.	8.11.49
Tamele	GCBF	W. J. Munt	P. J. Finan, D. Thompson, A. Lamper	F. Broomfield	Elder Dempster Lines, Ltd.	14.5.47
Tarkwa	MASU	G. D. Simpson	R. Munro, G. Moore, A. Bird	G. Gilling	Elder Dempster Lines, Ltd.	6.1.49
Tasso	GLMR	H. Scarborough	D. J. C. Martin, R. Cudbertson, R. Whittleton	J. Williamson	Ellerman's Wilson Line, Ltd. New Zealand Shipping Co., Ltd.	
Tekoa	GJFQ	H. D. Horwood, R.D., R.N.R.				
Telemachus	GBLB	G. Brown, M.B.E.	A. G. Reed, P. D. F. Cruickshank, E. Brown	J. Campbell-Wilson	A. Holt & Co.	11.2.49
Teviot	MASX	H. E. Sang	D. Guineas, R. J. Kistler, G. F. I. Jamieson	L. W. Bell	Royal Mail Lines, Ltd.	6.12.48
Thamesfield	GDGK	R. Cunningham	J. P. Ross, R. L. Newcombe, P. B. Goldie	T. Carter	Hunting & Son, Ltd.	16.12.48
Thule	GCBL	S. Anderson			Hector Whaling, Ltd.	
Tinto	GBYT	S. H. Bennett, M.B.E.	A. Ledger, E. J. Agar	G. Nicholls	Ellerman's Wilson Line, Ltd.	20.5.49
Tongariro	GLFZ	D. H. Chadwick	J. M. Mead, R. D. Parkin, J. B. Camping	J. A. Hasson	New Zealand Shipping Co., Ltd.	8.11.49
Torr Head	GZPW	M. Kennedy	J. A. McConville, A. J. Farrel, E. McCudden	G. Penkeith	G. Heyn & Sons, Ltd.	2.11.49
Tower Grange	MQJL	G. Robson	J. Milne, P. Westcote, R. B. Dawson	L. B. Priestley	Counties Ship Management Co., Ltd.	21.3.49
Tresillian	GCKP	C. R. Mill, O.B.E.	P. E. Maiden, D. M. Curror, F. D. Ingram	W. F. Kavanagh	Hain S.S. Co., Ltd.	9.9.49
Trevaylor	GCKG	A. G. Williams, O.B.E.	R. B. Oliver, W. E. Lyons, D. R. Jenkins	D. W. Cross	Hain S.S. Co., Ltd.	17.10.49
Tribesman	GBNZ	A Smart	W. Lawton, J. S. Jones, J. Adams	J. T. W. Nixon	T. & J. Harrison	10.11.48
Tribulus	GFJS	F. Leask			Anglo-Saxon Petroleum Co., Ltd.	
Tronda	MMLX	A. Goodlad	D. W. Falconer		Chr. Salvesen & Co.	
Tweed	GBRP	D. R. Miller	G. C. W. Meldrum, J. Chester, D. S. Guiness	A. McInnes	Royal Mail Lines, Ltd.	16.11.49
Twickenham	GNDC	J. A. Tully	M. Blair, J. Porteous, J. Taylor	T. O'Connor	Watts, Watts & Co., Ltd.	22.11.49
Umtali	GYWB	F. E. J. O'Hea	—. Nock, F. Evans, D. G. Jupp, D. McNeill	S. Hewitt	Bullard, King & Co., Ltd.	19.1.50
Umtata	GDQF	J. W. Miles	B. J. McAree, H. K. Underwood, L. Farrer	A. H. Coxhead	Bullard, King & Co., Ltd.	12.2.49
Umzinto	GIFQ	R. Harber	J. S. Miller, G. Driscoll, J. Collier	J. S. Sprunt	Bullard, King & Co., Ltd.	31.10.49

Name of Vessel	Call Sign	Captain	Observing Officers	Senior Radio Officer	Owners/Managers	Last Return Received
Valacia	MATR	J. G. Bradley, R.D., R.N.R.	N. Jones, J. D. Smythe, L. Porter	P. A. Hayes	Cunard White Star, Ltd.	13.12.47
Vancouver City	GIGT	H. Louttit	H. L. Evans, J. B. Cuckow, A. H. Bailey	B. Rowan	Sir Wm. Reardon Smith & Sons, Ltd.	6.9.49
Vardulia	GCFW	F. E. Patchett, R.D., R.N.R.	J. M. Hughes, A. Crook, P. Walton	F. Berry	Cunard White Star, Ltd.	14.10.48
Vienna	GTBR	A. P. Sutton	J. Shotton, R. Fergus, E. Atkinson	F. Howell	British Railways (Eastern Region)	
Volo	GPCJ	A. Morrill	T. Briggs, T. A. Firth, T. Johnson	G. Williams	Ellerman's Wilson Line, Ltd.	22.4.48
Waimana	MATW	L. J. Hopkins	A. S. D. Masters, J. W. Webster, J. B. Cousins, R. H. Dennison	J. Robinson	Shaw, Savill & Albion Co., Ltd.	10.5.49
Waipawa	GWXQ	F. A. Smith	J. Carroll, G. Watkins, —. Hignett	J. Murphy	Shaw, Savill & Albion Co., Ltd.	26.4.49
Wairangi	MATX	W. G. West	J. L. Harrison, G. Fairgrieve, F. Sangster	H. Jardine	Shaw, Savill & Albion Co., Ltd.	5.8.49
Waiwera	GBJB	B. Forbes-Moffatt	F. Charnley, J. Gunning, A. C. H. Childs	J. Downie	Shaw, Savill & Albion Co., Ltd.	25.1.50
Wanstead	GFLS	A. E. Woodcock			Watts, Watts & Co., Ltd.	
Warwick Castle	GRRJ	J. Trayner	H. D. Lawton, M. M. Melson, J. Armstrong	G. Shaw	Union-Castle Mail S.S. Co., Ltd.	23.6.49
William Scoresby	GFNM	A. F. Macfie, Lt. Cdr., R.N.R.			National Institute of Oceanography	
Winchester Castle	GTPZ	C. Page, R.D., R.N.R.	R. E. Neal, D. E. Harris, E. Holden	R. Brew	Union-Castle Mail S.S. Co., Ltd.	12.11.48
Yoma	GLPN	A. L. Rowlands	J. Whitehead, D. Wilson, T. F. Fields	W. Allen	P. Henderson & Co.	14.11.49
Zealandic	MAGJ	P. F. Owens	P. J. Brentnall, I. Saunders, B. Ditchburn	A. McLennon	Rio Cape Line, Ltd.	16.11.49
Zent	GRDW	F. T. Barber			Elders & Fyffes, Ltd.	28.1.48
Conway, H.M.S.	—	E. Hewitt, R.D., Capt., R.N.R.	The Senior Cadets	—	—	10.1.49
Pangbourne Nautical College	—	H. C. Skinner, O.B.E., Cdr., R.N.	The Senior Cadets	—	—	3.4.48
Worcester, H.M.S.	—	G. C. Steele, V.C., Cdr., R.N. (Retd.)	The Senior Cadets	—	—	20.12.49

FLEET LIST (New Zealand)
VOLUNTARY OBSERVING SHIPS

The following is a list of observing ships, voluntarily co-operating with the Meteorological Service of New Zealand.

Name of Vessel	Captain	Observing Officer	Radio Officer	Owners
Selected Ships :				
Kaitoke	H. S. Collier	G. R. Inkster	N. Barwell	Union S.S. Co.
Karetu	T. S. MacNicol	A. B. Macdonald	R. L. Nobbs	Union S.S. Co.
Karitane	C. W. Dovey	H. G. Harwood	A. E. Whalley	Union S.S. Co.
Kauri	W. H. C. Millward	R. E. P. Williams	L. V. Scott	Union S.S. Co.
Komata	W. J. Hill	J. C. Young	R. H. Willis	Union S.S. Co.
Kopua	F. T. Chapman	I. G. Sykes	W. L. Lambie	Union S.S. Co.
Korowai	J. Billingham	L. Joyce		Union S.S. Co.
Koromiko	A. F. Inman	J. W. Hannam	W. Hankins	Union S.S. Co.
Kurow	A. T. Adam	E. H. Busby	L. M. Harvey	Union S.S. Co.
Lautoka	A. Meldrum	F. Wright	L. Macallum	W. R. Carpenter & Co.
Matua	A. R. Russell	S. G. Taylor	E. H. Ward	Union S.S. Co.
Maui Pomare	L. C. Boulton	J. Hare	E. H. Ward	Union S.S. Co.
Monowai	G. B. Morgan, D.S.O., D.S.C.	D. A. Baigent	J. G. Rea	Union S.S. Co.
Piri	M. W. Monaghan	J. Drummond		Nobel (Australasia) Proprietary Ltd.
Port Waikato	C. Keith	J. Flett		Holm & Co.
Suva	R. Hamilton	E. G. Johnson	W. Marshall	W. R. Carpenter & Co.
Waipori	W. A. Gray	S. R. Davis	H. A. Shields	Union S.S. Co.
Wairata	F. W. Gibson	K. A. Manners	A. A. Lindsay	Union S.S. Co.
Wairimu	C. Burgess	J. G. Waites	C. Ward	Union S.S. Co.
Waitaki	E. F. Rainbow	S. R. Sleeman	L. C. Calvert	Union S.S. Co.
Waitemata	D. M. Keith	J. A. Barbour	J. A. Barbour	Union S.S. Co.
Supplementary Ships :				
James Cook	A. Deed	J. H. Kean	A. J. Jeans	H. C. Sliegh
Kaimiro	D. C. N. Champion	H. A. Hodkinson		Union S.S. Co.
Kapako	L. Sinclair	R. K. Brown	E. A. Miller	Union S.S. Co.
Karepo	W. Kehoe	E. M. Bieneman		Union S.S. Co.
Kartigi	G. H. Edwards	P. H. Pallin	R. N. Dennis	Union S.S. Co.
Kiwitea	R. Tulloch	J. R. Brace	N. F. Layther	Union S.S. Co.
Manuka	E. J. Johnson			Chatham Fishing Co.
Omana	H. H. Pike	H. J. Southworth	P. R. Walker	Union S.S. Co.
Viti	F. A. Barrett	L. Lindsay		Tasman S.S. Co.

FLEET LIST (Hong Kong)

VOLUNTARY OBSERVING SHIPS

The following is a list of observing ships, voluntarily co-operating with the Royal Observatory, Hong Kong.

Name of Ship	Captain	Observing Officers	Senior Radio Officer	Shipping Company or Operators
Anhui	J. McKinlay	A. J. Keddie, F. W. Ridley	Chan Cheong	China Navigation Co., Ltd.
Caroline Moller	W. J. Lang	I. E. Mathieson, E. Hugman, F. McKay	C. D. Joshi	Mollers' (Hong Kong), Ltd.
Chang Sha	C. P. Miller	W. J. Bunney, S. Fergusson	R. Gooseman	China Navigation Co., Ltd.
Choy Sang	A. G. Robjant	H. A. Greenwood, H. F. Smith, K. C. Young	E. Belard	Indo-China Steam Navigation Co., Ltd.
Chun Sang	D. G. R. Kinnear	E. M. Norman, R. P. Farquar, T. Y. Yuan	E. A. West	Indo-China Steam Navigation Co., Ltd.
Eastern Glory	L. McRae	W. E. Reeve, C. Thomson, R. Grieve	C. D. Evans	Indo-China Steam Navigation Co., Ltd.
Eastern Saga	S. Schofield	G. Parish, J. D. Markland, A. D. Lamb	R. E. Stewart	Indo-China Steam Navigation Co., Ltd.
E Sang	J. Fotheringham	L. C. Cox, E. P. Ladbrooke, A. O. Jakobsen	Im Ki	Indo-China Steam Navigation Co., Ltd.
Fengtien	F. Gibbs	W. D. Leighton, D. I. Robertson	Leung Shu Fun	China Navigation Co., Ltd.
Foochow	E. G. Thomas	C. L. Phillips, G. S. Ireland	Leung Man Hin	China Navigation Co., Ltd.
Fort Charlotte	F. P. Hennin	G. D. Pentney, T. J. Owen, P. P. Garbutt	G. H. Parker	Royal Fleet Auxiliary
Frosty Moller	L. Colmans	B. I. Algar, H. J. Young	A. G Pearce	Mollers' (Hong Kong), Ltd.
Fukien	G. T. M. Ramsay	G. Abbs, L. Walker	Leung Tjeuk Shing	China Navigation Co., Ltd.
Greystoke Castle	F. R. Milwright	F. Kelly, E. Docherty, R. W. Frappell	D. G. Sims	Mollers' (Hong Kong), Ltd.
Hai Lee	J. Hansen	A. Andreassen, J. Mikkelsen, H. Andersen	Chan Tze Yau	China Siam Line
Hang Sang	L. W. Harrison	K. P. Wilkinson, A. Moyse, A. Nelson	Young Shang	Indo-China Steam Navigation Co., Ltd.
Han Yang	G. P. Cope	E. J. Bower, W. E. S. Cream	Tsang Piu Leung	China Navigation Co., Ltd.
Heinrich Jessen	G. R. Hansen	J. P. Johannsen, C. S. Jensen, I. Yap	P. Johnke	Jebsen Steamship Co., td.
Hermelin	B. Eliassen	Th. Pedersen, A. Andersen, L. Nilsen	Th. Pedersen	China Siam Line
Hew Sang	M. I. Groundwater	L. I. Ovsiannikoff, P. D. Coles, H. Wood	Ho Hung Ki	Indo-China Steam Navigation Co., Ltd.
Hin Sang	C. R. Harris	B. D. Hoatson, T. W. Scott, D. Dekker	Lok Yung	Indo-China Steam Navigation Co., Ltd.
Hiram	S. Olsen	T. Torkildsen, H. Berge, J. Jacobsen	Chan Kam Tsun	China Siam Line
Hoi Wong	M. Bjerkenes	N. Fiskaaen, B. Maeland, O. Lindanger	H. Bru	Karten Larssen Shipping Co.
Hong Siang	R. E. Agar	R. Goss, J. M. McHaughton, K. B. Indros	E. A. West	Ho Hong Steamship Co.
Hunan	A. H. Finnie	D. P. Manthorpe, P. Flory	Choi Pong Cheung	China Navigation Co., Ltd.
Hupeh	W. E. Awcock	W. Pollock, E. W. Woodcock	Tsang Kau	China Navigation Co., Ltd.
Kut Sang	D. G. Burleigh	F. H. Main, S. A. Sheridan, F. L. Rowden	G. McDonald	Indo-China Steam Navigation Co., Ltd.
Kweiyang	J. Taylor	H. M. Stanfield, V. Walker	Leung Kan	China Navigation Co., Ltd.
Lok Sang	R. I. Groundwater	F. W. Cross, J. McK. Marshall, J. K. Keng	J. E. Chew	Indo-China Steam Navigation Co., Ltd.
Mui Ann	J. Mathiasen			Chin Seng Hong
Mau Sang	R. G. Gillespie	J. H. Thomas, D. R. McFadzien, D. D. Battell	A. G. Lum	Indo-China Steam Navigation Co., Ltd.
Muncaster Castle	A. G. Gorham	W. A. Finlay, L. L. Watson, P. Potts, A. Layfield	V. B. Ritson	Mollers' (Hong Kong), Ltd.
Nanchang	J. W. Evans	S. J. Yeandle, E. C. C. Trestrail	Chau Wing	China Navigation Co., Ltd.
Newchwang	M. Defty	J. F. O'Dowd, C. Stark	Liu Yuk Kong	China Navigation Co., Ltd.
Ning Hai	F. Kelly	S. H. Liu	Lo Kin Chak	China Navigation Co., Ltd.
Pakhoi	D. Wilson	S. Davidson, R. Perry	Tang Chung Fiu	China Navigation Co., Ltd.
Poyang	D. M. Holmes	A. V. Harrison, W. T. Masters	Li San Kau	China Navigation Co., Ltd.
Sangola	J. B. Cooke	G. A. Brignall, J. Roberts, J. R. Snelgrove	J. E. Martlieu	British India Steam Navigation Co.

Shansi	W. B. B. Paul	J. R. Keddie	Sun Kwong Yee	China Navigation Co., Ltd.
Shengking	D. Brotchie	R. Selwyn-Jones, W. Layfield	Li Chiu Tsai	China Navigation Co., Ltd.
Shirala	B. Wright	D. S. Hutton, H. N. L. Roberts, C. G. Hirst	K. J. Bourke	British India Steam Navigation Co.
Sinkiang	A. Taylor	L. King, J. Hunter	E. J. Rozario	China Navigation Co., Ltd.
Sirdhana	H. E. Evans	B. Bailey, G. Usher, E. R. Daniels	J. E. Ward	British India Steam Navigation Co.
Soochow	F. N. Booth	R. C. W. Gorman, J. C. Christal	F. Gellatly	China Navigation Co., Ltd.
Stanvac Meifoo	L. A. Sterling	D. R. Williams, G. Beesley	Yu Pak Pui	Standard Vacuum Oil Co.
Szechuen	O. Fox	W. E. Hargrave, R. Tasker	U In San	China Navigation Co., Ltd.
Tai Chung Shan	A. H. Bathurst	A. E. Lovgreen, Chan Sai Chung	Pong Shiu Lun	Shun Cheong Steam Navigation Co.
Tak Sang	E. J. Thomson	T. J. Ashcroft, E. A. Ladbrooke, R. Latchum	G. N. Williams	Indo-China Steam Navigation Co., Ltd.
Tsinan	J. G. Smart	F. Hindle	Wai Pun Un	China Navigation Co., Ltd.
Wing Sang	H. G. Goddard	W. J. Bartlett, W. Graham, G. E. Tinley	F. Hayes	Indo-China Steam Navigation Co., Ltd.
Wosang	N. H. King	T. C. Marr, L. Manser, C. M. Wilson	A. W. Lavack	Indo-China Steam Navigation Co., Ltd.
Yochow	M. McMillan	M. McLeod, A. Harper	Cheung Shing Cheung	China Navigation Co., Ltd.
Yunnan	A. Naismith	S. Duff, G. D. O. Rennie	Lee Hon Chung	China Navigation Co., Ltd.

FLEET LIST (India)

The following is a list of observing ships, voluntarily co-operating with the India Meteorological Department

Name of Vessel	Owners
Selected Ships :	
Alavi	Asiatic Steam Nav. Co., Ltd.
Bahadur	Asiatic Steam Nav. Co. Ltd.
Chanda	British India Steam Nav. Co., Ltd.
Dara	British India Steam Nav. Co., Ltd.
Dumra	British India Steam Nav. Co., Ltd.
Dwarka	British India Steam Nav. Co., Ltd.
Englishtan	Scindia Steam Nav. Co., Ltd.
Havildar	Asiatic Steam Nav. Co., Ltd.
Islami	Asiatic Steam Nav. Co., Ltd.
Jaladuta	Scindia Steam Nav. Co., Ltd.
Jalaganaga	Scindia Steam Nav. Co., Ltd.
Jalajyoti	Scindia Steam Nav. Co., Ltd.
Jalamani	Scindia Steam Nav. Co., Ltd.
Jalamohan	Scindia Steam Nav. Co., Ltd.
Jalarashmi	Scindia Steam Nav. Co., Ltd.
Jalaveera	Scindia Steam Nav. Co., Ltd.
Jalavihar	Scindia Steam Nav. Co., Ltd.
Jalayamuna	Scindia Steam Nav. Co., Ltd.
Jehangir	Asiatic Steam Nav. Co., Ltd.
Kampala	British India Steam Nav. Co., Ltd.
Karanjia	British India Steam Nav. Co., Ltd.
Karapara	British India Steam Nav. Co., Ltd.
Khandalla	British India Steam Nav. Co., Ltd.
Khosrou	Asiatic Steam Nav. Co., Ltd.
Maharaja	Asiatic Steam Nav. Co., Ltd.
Masimpur	Burma Oil Co.
Nadir	Asiatic Steam Nav. Co., Ltd.
Nahadevi	Asiatic Steam Nav. Co., Ltd.
Nurjehan	Asiatic Steam Nav. Co., Ltd.
Pundit	Asiatic Steam Nav. Co., Ltd.
Rajput	Asiatic Steam Nav. Co., Ltd.
Rajula	British India Steam Nav. Co., Ltd.
Shahjehan	Asiatic Steam Nav. Co., Ltd.
Shirala	British India Steam Nav. Co., Ltd.
Singu	Burma Oil Co.
Sirsa	British India Steam Nav. Co., Ltd.
Subedar	Asiatic Steam Nav. Co., Ltd.
Tairea	British India Steam Nav. Co., Ltd.
Vasna	British India Steam Nav. Co., Ltd.
Yenang Young	Burma Oil Co.
Supplementary Ships :	
Akbar	Asiatic Steam Nav. Co., Ltd.
Badarpur	Burma Oil Co.
Bamora	British India Steam Nav. Co., Ltd.
Barla	British India Steam Nav. Co., Ltd.
Barpeta	British India Steam Nav. Co., Ltd.
Begum	Asiatic Steam Nav. Co., Ltd.
Binfield	British India Steam Nav. Co., Ltd.
Itaura	British India Steam Nav. Co., Ltd.
Jaladurga	Scindia Steam Nav. Co., Ltd.
Jalagopal	Scindia Steam Nav. Co., Ltd.
Jalakrishna	Scindia Steam Nav. Co., Ltd.
Jalaratna	Scindia Steam Nav. Co., Ltd.
Jalavijaya	Scindia Steam Nav. Co., Ltd.
Malika	Asiatic Steam Nav. Co., Ltd.
Nurani	Asiatic Steam Nav. Co., Ltd.
Pasha	Asiatic Steam Nav. Co., Ltd.
Risalder	Asiatic Steam Nav. Co., Ltd.
Rizwani	Asiatic Steam Nav. Co., Ltd.

FLEET LIST (Canada)

VOLUNTARY OBSERVING SHIPS

The following is a list of observing ships voluntarily co-operating with the Meteorological Service of Canada

NAME OF VESSEL	OWNERS
Selected Ships:	
Aorangi	Canadian Australasian Line.
Canadian Challenger	" Canadian Challenger ", Ltd. (Canadian National Steamships).
Canadian Constructor	" Canadian Constructor ", Ltd. (Canadian National Steamships).
Canadian Cruiser	" Canadian Cruiser ", Ltd. (Canadian National Steamships).
Fort Amherst	Furness, Withy & Co.
Fort Townshend	Furness, Withy & Co.
Imperial Alberta	Imperial Oil, Ltd.
Imperial Quebec	Imperial Oil, Ltd.
Imperial Toronto	Imperial Oil, Ltd.
Imperial Winnipeg	Imperial Oil, Ltd.
Imperial Victoria	Imperial Oil, Ltd.
Lady Nelson	" Lady Nelson ", Ltd. (Canadian National Steamships).
Lady Rodney	" Lady Rodney ", Ltd. (Canadian National Steamships).
Victoria County	Acadia Overseas Freighters.
Waihemo	Canadian Union Line, Ltd.
Waikawa	Canadian Union Line, Ltd.
Wairuna	Canadian Union Line, Ltd.
Waitomo	Canadian Union Line, Ltd.
Lightships :	
Lurcher Lightship	Minister of Transport.
Sambro Lightship	Minister of Transport.
Supplementary Ships :	
Lake Athabaska	Western Canadian Steamship Co., Ltd.
Lake Chilco	Western Canadian Steamship Co., Ltd.
Lake Kootenay	Western Canadian Steamship Co., Ltd.
Lake Minnewanka	Western Canadian Steamship Co., Ltd.
Rupertsland	Hudson's Bay Co., Ltd.

LIGHT VESSELS

The following Light Vessels voluntarily observe and report from coastal waters of Great Britain.

NAME OF VESSEL	MASTERS
Dowsing	
East Goodwin	A. Giblin, F. M. England
Galloper	
Humber	F. I. Butcher, L. A. Brett
Newarp	B. Hadden, R. J. Middleton, E. A. Sparks.
Royal Sovereign	W. J. Sheaf
Shipwash	G. W. Broom, C. G. Isaac
Smith's Knoll	

MARID SHIPS

The following is a list of ships voluntarily observing and reporting sea temperatures from coastal waters of Great Britain. Captains are requested to point out any errors or omissions in the list.

Name of Vessel	Call Sign	Captain	Owners/Managers
Accrington	GDMJ	R. Good	British Railways (Eastern Region).
Actuality	GPPF	W. Conn	F. T. Everard & Sons, Ltd.
Allurity	MQFS	A. Fisher	F. T. Everard & Sons, Ltd.
Angelo	GQFY	S. N. Stokes	Ellerman's Wilson Line, Ltd.
Antwerp	GDFV	R. V. Adams	British Railways (Eastern Region).
Ariosto	GKPW	W. Hill	Ellerman's Wilson Line, Ltd.
Atlantic Coast	GWSY	P. A. Johnson	Coast Lines, Ltd.
Baltraffic	GTXN	F. Waldron	United Baltic Corporation, Ltd.
Belhaven	MNXZ	P. L. Irvine	London & Edinburgh Shipping Co., Ltd.
Belravock	MKGV	T. Wallace	London & Edinburgh Shipping Co., Ltd.
Belvina	MLZF	J. Philip	London & Edinburgh Shipping Co., Ltd.
Bury	GRNM	R. G. Watts	British Railways (Eastern Region).
Cambria	GBKT	W. H. Hughes, D.S.C.	British Railways (London Midland Region).
Clupea	GOAJ	A. E. B. Brown	Scottish Home Department (Fishery Division).
Corfen	GDJX	E. Allen	Wm. Cory & Son, Ltd.
Corfleet	GWTD	L. A. Griffin	Wm. Cory & Son, Ltd.
Corfoss	MAHX	F. W. Farrant	Wm. Cory & Son, Ltd.
Cormain	MAHT	R. Armstrong	Wm. Cory & Son, Ltd.
Cormead	GDBX	T. Slack	Wm. Cory & Son, Ltd.
Cormist	GDVT	R. Barrow	Wm. Cory & Son, Ltd.
Cormoat	GLKV	J. V. Hansen	Wm. Cory & Son, Ltd.
Cormull	MAHS	E. Keene	Wm. Cory & Son, Ltd.
Corncrake	MJKL	W. Aplin	General Steam Nav. Co. Ltd.
Crane	MMCS	C. C. Reynolds	General Steam Nav. Co., Ltd.
Drake	MMYC	R. Langley	General Steam Nav. Co., Ltd.
Duke of Argyll	GNVX	A. E. Willmott, D.S.C., R.D., Cdr., R.N.R.	British Railways (London Midland Region).
Duke of Lancaster	GCPQ	E. B. Serjeant	British Railways (London Midland Region).
Duke of Rothesay	GNVL	H. Thompson	British Railways (London Midland Region).
Duke of York	GYKV	C. Baxter	British Railways (Eastern Region).
Eastern Coast	GWNV	R. E. Holt	Coast Lines, Ltd.
Eildon	MLZL	J. Little	G. Gibson & Co., Ltd.
Empire Cedric	GRSC	W. N. Johnson	Frank Bustard & Sons, Ltd.
Empire Doric	MAVQ	H. T. Green	Frank Bustard & Sons, Ltd.
Empire Gaelic	MAVR	H. T. Green	Frank Bustard & Sons, Ltd.
Explorer	MRCZ	D. C. Sandison	Scottish Home Department (Fishery Division).
Falcon	MNXL	S. W. Devlin	General Steam Nav. Co., Ltd.
Golden Dawn	—	Lieut. A. Adamson, M.B.E., R.N.R.	The Captain.
Goldfinch	MMCR	C. Carr	General Steam Nav. Co., Ltd.
Granta	GNJR	D. A. Hunter	Witherington & Everett.
Grebe	MAEY	E. C. Painter, D.S.C.	General Steam Nav. Co., Ltd.
Guernsey Coast	MANS	F. C. Lucas, M.B.E.	British Channel Islands Shipping Co., Ltd.
Harrogate	MNDB	C. H. Tully	Associated Humber Lines.
Hibernia	MBMT	A. Marsh	British Railways (London Midland Region).
Highwood	MLQQ	J. Coupland	E. R. Newbigin, Ltd.
Hindlea	GWDQ	A. E. Holder	Hindlea Shipping Co., Ltd.
Isle of Guernsey	GQYJ	F. E. Trout	British Railways (Southern Region).
Isle of Sark	GTSR	C. E. Durley	British Railways (Southern Region).
Lairdsburn	GTND	J. McColl	Burns & Laird Lines, Ltd.
Lairdswood	GYZQ	H. Campbell	Burns & Laird Lines, Ltd.
Lapwing	GKBP	S. Tomlin	General Steam Nav. Co., Ltd.
London Merchant	MBRZ	C. A. Piper	London Scottish Lines, Ltd.
Melrose Abbey	GSYW	J. Laverack	Associated Humber Lines.
Minna	GKPS	T. Mather	Fishery Board for Scotland.
Ocean Coast	GYMP	G. Mearns	Coast Lines, Ltd.
Otterhound	MNVZ	A. M. Kennedy	Coastal Tankers, Ltd.
Persian Coast	MJNL	T. Taylor	Tyne-Tees S.S. Co., Ltd.
Petrel	MBGV	G. W. Lawrey	General Steam Nav. Co., Ltd.
Plover	MLLV	W. J. Tait	General Steam Nav. Co., Ltd.
St. Andrew	GPQW		British Railways (Western Region).
St. Helier	GLBT	R. Pitman, D.S.C.	British Railways (Western Region).
St. Julien	GLBV	L. J. Richardson	British Railways (Western Region).
Salerno	GSPW	H. Greenhill	Ellerman's Wilson Line, Ltd.
Scotia	GIFS	E. A. Bruce	Scottish Home Department (Fishery Division).
Selby	MLFT	A. W. Johnston	Associated Humber Lines.
Slieve Bawn	MQCC	J. Irwin	British Railways (London Midland Region).
Slieve Bearnagh	MLNL	W. N. Greenwood	British Railways (London Midland Region).
Slieve Bloom	MQDD	A. C. Borthwick	British Railways (London Midland Region).
Slieve Donard	MQCQ	W. E. Mead	British Railways (London Midland Region).
Slieve League	MQCM	V. S. Phillips	British Railways (London Midland Region).
Slieve More	MQBM	R. Woodhall	British Railways (London Midland Region).
Southern Coast	MASD	J. Studholm	Coast Lines, Ltd.
Vanellus	GDVW	J. E. Green	British & Continental S.S. Co., Ltd.
Wandle	MKBB	E. Clarke, M.B.E.	South Eastern Gas Board.

NOTICES TO MARINE OBSERVERS

Postal Arrangements

The quarterly numbers of *The Marine Observer* are published on the last Wednesdays of December, March, June and September.

The Marine Observer is addressed to the Captain, S.S./M.V....., c/o the owners, and captains are requested to make their own arrangements for forwarding.

Shipowners, Marine Superintendents, and all concerned in the despatch of mails to ships are asked to kindly facilitate the despatch and delivery of mail received at their offices from the Meteorological Office and " Air Publications and Forms Stores ", to their ships abroad.

Addressed to the captains of ships, this contains information required for the conduct of meteorological work at sea, and is most effective if received by the captains at the earliest possible date.

Ice Observation

Drifting ice, derelicts, and other floating dangers to navigation are reported by all means of communication at the disposal of the master.

See Appendix III, pages 106-108 of the *Marine Observer's Handbook*, Sixth Edition.

It is also desirable that more detailed information than can be given in a TTT wireless message should be available to the Meteorological Office for the purpose of research, and for Admiralty Charts and Sailing Directions.

Marine observers will greatly assist by noting the conditions of ice, either drifting or fast, in the pages provided at the end of the logbook (Form 911), or on Form 912, which may be supplied to the captain of any British ship on application to a Port Meteorological Officer or Merchant Navy Agent.

Observing ships using the Trans-North Atlantic tracks are requested to record not only when ice is encountered, but also when they have passed through the ice region during the ice season without encountering ice. In this case a " nil " report should be returned, since it is desirable as far as possible to determine when tracks have been clear of ice.

RETURN OF LOGBOOKS

Owing to the need for strict economy in the use of paper, observing officers should endeavour to fill up their logbooks (Forms 911), before returning them to the appropriate Meteorological Service, except when insufficient space remains for the recording of observations during a further complete passage.

Meteorological Services for Shipping

Captains of British ships are requested to notify the Marine Branch of the Meteorological Office of areas in which meteorological services for shipping appear inadequate. Suggestions for the improvement of these services are always welcome.

Fleet List Call Signs

The inclusion of the signal letters (call signs) of the British Selected Ships in the Fleet List is largely for the benefit of those meteorological service who might wish to identify the ships concerned in a " collective " message.

GREAT BRITAIN—LOCAL WEATHER FORECASTS

Masters of ships and others interested in the movements of shipping and in the loading and discharging of cargo can obtain local weather forecasts from the forecast centre nearest to the port, free of charge.

The addresses and telephone numbers of the forecast centres nearest to the main ports of Great Britain are given below, corrected to September, 1949.

Port	Address of Nearest Forecast Centre	Telephone No.
Aberdeen	The Meteorological Officer, Dyce Airport, Aberdeenshire	Dyce 331. Ex. 70
Bristol	The Meteorological Officer, Bristol Airport, Whitchurch, Bristol	Bristol 26451. Ex. 22
Cardiff	The Senior Meteorological Officer, Air Traffic Control Centre, Royal Air Force, Eastern Avenue, Barnwood, Gloucester	Gloucester 24465/6/7. Ex. 110, 111.
Dundee	The Senior Meteorological Officer, H.Q. No. 18 Group, Royal Air Force, Pitreavie Castle, Dunfermline, Fife	Inverkeithing 264/5 Ex. 118/9.
Falmouth	The Senior Meteorological Officer, H.Q. 19 Group, Royal Air Force, Mount Batten, Plymouth, Devon	Plymstock 2224. Ex. 108/9.
Glasgow	The Meteorological Officer, Renfrew Airport, Renfrewshire	Renfrew 2352. Ex. 21/3.
Hartlepool	The Senior Meteorological Officer, Royal Air Force, Watnall, Nottingham	Nottingham 45731/5. Ex. 230/1.
Hull	The Senior Meteorological Officer, H.Q. No. 1 Group, Royal Air Force, Bawtry, Doncaster, Yorkshire	Bawtry 363/7. Ex. 105
Inverness	The Senior Meteorological Officer, Royal Air Force, Raigmore, Inverness	Inverness 1853/8. Ex. 62/65.
Kirkwall	The Meteorological Officer, Hatston Airport, Orkneys	Kirkwall 421. Ex. 2.
Leith	The Senior Meteorological Officer, H.Q. No. 18 Group, Royal Air Force, Pitreavie Castle, Dunfermline, Fife	Inverkeithing 264/5 Ex. 118/9.
London	The Director, Meteorological Office, Air Ministry, Kingsway, London, W.C.2	Holborn 3434. Ex. 629.
Liverpool	The Senior Meteorological Officer, Speke Airport, Liverpool, 19	Garston 1240. Ex. 21/2.
Milford Haven	The Senior Meteorological Officer, H.Q. No. 19 Group, Royal Air Force, Mount Batten, Plymouth, Devon	Plymstock 2224. Ex. 108/9.
Newcastle	The Senior Meteorological Officer, Royal Air Force, Watnall, Nottingham	Nottingham 45731. Ex. 230/1.
Plymouth	The Senior Meteorological Officer, H.Q. No. 19 Group, Royal Air Force, Mount Batten, Plymouth, Devon	Plymstock 2224. Ex. 108/9.
Southampton	The Senior Meteorological Officer, Southampton Airport	Eastleigh 87228. Ex. 8/10.
Swansea	The Senior Meteorological Officer, Air Traffic Control Centre, Royal Air Force, Eastern Avenue, Barnwood, Gloucester	Gloucester 24465/6/7. Ex. 110.

NAUTICAL OFFICERS AND AGENTS OF THE MARINE DIVISION OF THE METEOROLOGICAL OFFICE, GREAT BRITAIN

Captains and observing officers of the Voluntary Corps of Marine Observers will always be welcomed at headquarters, where the Marine Superintendent will be pleased to show them how their observations are utilised in meteorological research and weather forecasting.

Headquarters

Commander C. E. N. Frankcom, O.B.E., R.D., R.N.R., Marine Superintendent, Meteorological Office, Air Ministry, Headstone Drive, Harrow, Middlesex. (Telephone: Harrow 4331, Ext. 324.)

Commander J. Hennessy, R.D., R.N.R., Deputy Marine Superintendent. (Telephone: Harrow 4331, Ext. 323.)

Mersey

Commander M. Cresswell, R.N.R., Port Meteorological Officer, Room 617, Royal Liver Building, Liverpool, 3. (Telephone: Central 6565.)

Thames

Commander C. H. Williams, R.D., R.N.R., Port Meteorological Officer, Room 4, Ibex House, Minories, London, E.C.3. (Telephone: Royal 1721.)

Bristol Channel

Mr. J. C. Matheson, Port Meteorological Officer, 2 Bute Crescent, Cardiff. (Telephone: Cardiff 4474.)

Southampton

Captain J. R. Radley, Port Meteorological Officer, 19 Queen's Terrace, Southampton. (Telephone: Southampton 4295.)

AGENTS

Clyde

Captain W. W. Elliott, c/o Thomas Hastie & Son, 2–4 Tullis Street, Bridgeton, Glasgow. (Telephone: Bridgeton 3219.)

Forth

Captain G. More, "Craigneuk", Dechmont, West Lothian. (Telephone: Dechmont 19.)

Humber

Captain R. E. Dunn, c/o Principal Officer, Ministry of Transport, Trinity House Yard, Hull.

Tyne

Captain F. B. West, Custom House Chambers, Quayside, Newcastle-on-Tyne. (Telephone: Newcastle 23203.)

OFFICERS OF THE METEOROLOGICAL SERVICES OF THE BRITISH COMMONWEALTH

CANADA

Headquarters

Controller, Meteorological Division, Department of Transport, 315 Bloor Street W., Toronto, 5.

Halifax

O.I.C. Dominion Public Weather Office, 728 Dominion Public Building, Halifax, N.S. (Telephone : 3–8314.)

Saint John

Officer in Charge, The Observatory, Saint John, N.B. (Telephone : 3–3500.)

Vancouver

Mr. C. H. Bromley (acting), 815 Bower Building, 543 Granville Street, Vancouver, B.C. (Telephone : PAcific 3032.)

NEW ZEALAND

Wellington

The Director, Meteorological Office, Kelburn, Wellington, New Zealand. (Telephone : 44418.)

Marine Meteorological Officer, Post Office Box 72. (Telephone 44–418 ; Ext. 930.)

Auckland

Port Meteorological Officer, Meteorological Office, Mechanics Bay, Auckland. (Telephone : 49551.)

Lyttleton

Officer-in-Charge, Meteorological Office, Wigram Aerodrome. (Telephone : 32–585.)

Dunedin

Officer-in-Charge, Meteorological Office, Taieri Aerodrome, Dunedin. (Telephone : 21–666.)

SOUTH AFRICA

Cape Town

A. B. Crawford, Meteorological Office, Post Office, Maitland, Cape Town.

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Publications may be ordered from the Sale Offices of His Majesty's Stationery Office at the Addresses shown on the title page or through any bookseller

Cloud Forms. Definitions and descriptions, with photographs of clouds. M.O. 233, 6th Edition, 1949. 8vo. 1*s.* 3*d.* Postage 1*d.*

Weather Map. An introduction to modern meteorology. M.O. 225 i, 3rd edition, 1939. 8vo. (see also Meteorological Glossary, in continuation of the "Weather Map") 3*s.* Postage 2*d.*

Meteorological Glossary (continuation of the "Weather Map", *q.v.*). M.O. 225, ii 3rd edition, 1939. 8vo. 7*s.* 6*d.* Postage 5*d.*

Handbook of Weather Messages, Codes and Specifications. M.O. 510. 8vo.

Part I. Transmission schedules and station index numbers 1949. 2*s.* 6*d.* Postage 2*d.*

Part II. Codes and specifications. 1948. 1*s.* 6*d.* Postage 2*d.*

Part III. Coding, decoding and plotting 1948. 2*s.* Postage 2*d.*

(*Amendments issued as necessary and priced separately.*)

Instructions for the preparation of weather maps with tables of the specifications and symbols. M.O. 515. 1949. 8vo. 9*d.* Postage 1*d.*

International Meteorological Code adopted by the International Meteorological Organisation, Washington, 1947. **Decode for the use of shipping,** incorporating the code for weather reports from and to ships and the analysis code for the use of shipping. M.O. 509. 1948. 9*d.* Postage 1*d.*

Meteorological Handbook for Pilots and Navigators. M.O. 448, 2nd edition, 1942. 8vo. 2*s.* 6*d.* Postage 2*d.*

A Short Course in Elementary Meteorology. By W. H. Pick, B.Sc., F.C.P., F.Inst.P. M.O. 247, 5th edition, 1938. 8vo. 2*s.* 6*d.* Postage 3*d.*

Meteorology for Aviators. By R. C. Sutcliffe, Ph.D. M.O. 432, 1940. 8vo. 7*s.* 6*d.* Postage 6*d.*

Meteorology of Airfields. By C. S. Durst, B.A. M.O. 507, 1949. 8vo. 2*s.* Postage 2*d.*

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